The Library of Congress'

EARLY STATE RECORDS PROJECT

converted from the original microfilm held by the
Vincent C. Immel Law Library, Saint Louis University

through the generous support of a grant from the

Council on Library and Information Resources

THIRD BIENNIAL REPORT

Of the

State Board of Horticulture

Of the

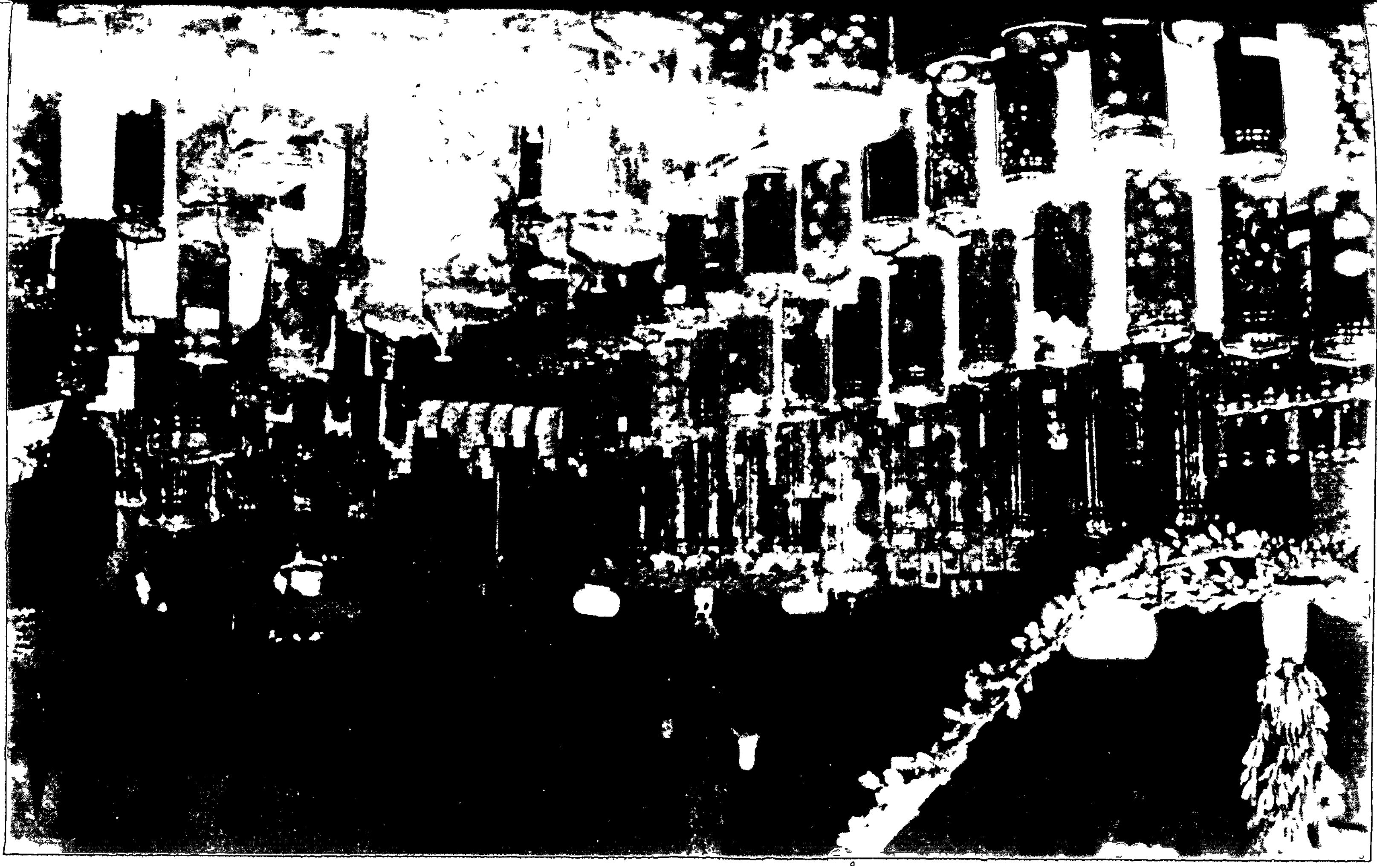
. . . STATE OF WASHINGTON . . .

FOR THE YEARS 1895-1896.

EDITED BY THE SECRETARY.

OLYMPIA, WASH.
GWIN HICKS - - - STATE PRINTER.
1897.

D. M. JESSEE.



STATE BOARD OF HORTICULTURE.

OFFICE 625 PACIFIC AVENUE, TACOMA.
(In N. P. R. W. Headquarters Building.)

OFFICERS AND MEMBERS.

CHATFIELD KNIGHT, ... VANCOUVER.
COMMISSIONER FOR THE FIRST DISTRICT.

CHAS. H. ROSS, ... VAN PUYALLUP.
COMMISSIONER FOR THE SECOND DISTRICT.

A. J. M. HOSOM, ... COUPEVILLE.
COMMISSIONER FOR THE THIRD DISTRICT.

S. W. MAXEY, ... ELLENSBURG.
COMMISSIONER FOR THE FOURTH DISTRICT

D. M. JESSEE, *President*, ... WALLA WALLA.
COMMISSIONER FOR THE FIFTH DISTRICT.

H. H. SPALDING, ... ALMOTA.
COMMISSIONER FOR THE SIXTH DISTRICT.

L. CHEADLE, ... ADELAIDE.
COMMISSIONER FOR THE STATE AT LARGE.

J. F. CASS, ... TACOMA.
SECRETARY, (625 Pacific Avenue.)

LETTER OF TRANSMITTAL.

To His Excellency J. H. McGraw, Governor, and the Honorable, the Legislature of the State of Washington:

Pursuant to the Act of the Legislature creating it, the State Board of Horticulture of the State of Washington herewith takes pleasure in presenting for your consideration its Third Biennial Report of the transactions of the said Board, and of its expenditures in detail, together with such other information and suggestions as would seem timely and applicable, and appertaining to the upbuilding of the horticultural interests generally.

During the somewhat unparalleled depression of our material interests common here more or less, as well as in the whole country at large, one feature of the outlook here in our own state has been always very prominently in view, viz: The grandeur of the natural resources—as well as the climatic and commercial advantages—of ours, the most favored state in the Union.

Acknowledged to be in the lead among all the states in the line of two of the great staples of wealth and commerce, fish and timber, we need only the development of a few years to show that our natural advantages for the production of the fruits common to the temperate zone are not second to those of any other state of the Union. The conditions most desirable and necessary for the growing of the different fruits in their greatest perfection are found in the various sections of the state, so diverse are they as regards altitude, temperature, humidity of the atmosphere, etc. So that each of this class of fruit finds its best environment in some one or more of the varied conditions that obtain in the different localities and districts in the state. We needing now only, and more particularly, such information as practical experience and observation can give as to the adaptability of the different fruits to the diverse conditions before named.

While as yet in our state, probably, not one-fourth of the fruit trees planted are in bearing, it is safe to say that our annual fruit production will approximate to about $2,000,000, and that five years hence it will amount to fully $10,000,000 in value. And we can confidently expect that in the near future the northern tier of states lying west of the Mississippi will be drawing principally upon us for their supply of fruit, our advantages of climate, etc., and the fact of our fruits being in quality much superior to those of the same kind grown in the states of the Pacific Slope south of us, giving us at no distant date largely a monopoly of production in certain lines of these. Our climate and conditions are also of the best for growing in their greatest perfection the various vegetables and horticultural products.

The practical knowledge gained by the experience of recent years leads us to believe that the depredations of insect pests and fungous diseases common to the tree and plant life here can be kept well in check; and that it is but a question of enlightened culture and work as to whether we can produce here, and at the same time make commercially profitable, the growing of the best of the various fruit and other horticultural products adapted to our climate and conditions.

And to the end that all available light may be thrown upon the subject of horticulture and fruit growing in all their branches, not only by disseminating such information as may be common to all, but from such as may come from original research and investigation, this Board would lend its continued endeavors, and asks for the most favorable consideration at your hands, and from the public of the state at large.

Very Respectfully,

D. M. JESSEE, President.

J. F. CASS, Secretary.

STATE BOARD OF HORTICULTURE.

FINANCIAL STATEMENT.

TACOMA, WASH., October 14, 1896.

To the Honorable State Board of Horticulture:

GENTLEMEN—We your committee appointed to investigate and report upon the finances of the board, would respectfully submit the following, as shown by our books of account, being a statement of account from and including April, 1895:

Amount paid to Commissioner J. Blackburn	$106 25
Amount paid to Commissioner L. Cheadle	562 90
Amount paid to Commissioner S. W. Maxey	512 05
Amount paid to Commissioner J. F. Cass	370 40
Amount paid to Commissioner D. M. Jessee	701 30
Amount paid to Commissioner C. H. Ross	489 55
Amount paid to Commissioner H. H. Spalding	200 40
Amount paid to Commissioner C. Knight	488 10
Amount paid to Secretary C. A. Tonneson	860 00
Amount paid to Secretary J. F. Cass	280 00
Amount paid for incidental expenses, postage, etc	270 93
Amount paid for incidental expenses, engravings for report	70 50
Total amount paid out	$4892 38

(Signed) A. J. M. HOSOM.
CHATFIELD KNIGHT.
S. W. MAXEY.

OFFICE OF THE STATE BOARD OF HORTICULTURE.
TACOMA, WASH., October 14. 1896.

I hereby certify the above and foregoing to be a true, full, and complete transcript of the report of the Finance Committee appointed by the said board at its regular semi-annual meeting convened on October 12th, inst., as the same appears on file in this office.

[SEAL.] J. F. CASS, Secretary.

REPORT OF PRESIDENT AND COMMISSIONER OF THE FIFTH DISTRICT.

D. M. JESSEE, WALLA WALLA.

To the Honorable State Board of Horticulture:

GENTLEMEN—Allow me to submit my report for the past eighteen months. I want to congratulate the state board for the good work they have done. While I feel that much more good might have been accomplished if the appropriation had been sufficient to justify the thorough work that is required. A large amount is needed for traveling expenses in each district, and this consumes a large proportion of the appropriation. Each member of the board has been alive, as far as possible under the embarrassing circumstances that we are all laboring under, and have accomplished for this state a boon that cannot be estimated.

Take the one item alone which is worth many thousand dollars, that of educating the young fruit grower to be careful not to plant any fruit trees until they have been carefully inspected to prevent the introduction of pests, which after they have come in will require great effort to destroy them.

I have condemned many fruit trees that were infested with the pest, known as the San Jose scale, and had them destroyed. The members of the board should be very careful inspecting nursery stock. It requires very careful inspection, and we should always recommend fruit growers when they purchase fruit trees to call for the certificate of inspection; if they have none, pass them by.

I have traveled all over my district and in some localities the fruit growers are taking great interest in proper training, pruning, and cultivation, and the result has proven satisfactory. Their returns are good, while others plant trees in unprepared ground, and then let them go without proper care, and the result is no fruit, and no fruit trees in a few years, and then say this is no fruit country, and it won't pay to bother with fruit growing any longer.

The growing of fruit in this state has become one of the leading industries, bringing better returns than any other product.

The farmers have become very much interested, and have found by past experience that nothing pays as well as their fruit growing. My own district will ship about six hundred car loads of fruit this season, notwithstanding that our fruit crop is very light—being not more than one-half a crop—yet they will realize more than three times what the same number of producers would in growing wheat. It does not cost all the worth of the crop to harvest it.

Notwithstanding all the pests, tree planting goes on. There has been sold in my district this year more than eight hundred thousand trees. I have visited and inspected more than seven hundred orchards, most of them in fine condition. The insect pests are widely disseminated, but with the experience the board has had they are better able to give the proper instruction and the remedies for disinfection. Some orchards under my own observation have been very thoroughly sprayed, and where the San Jose scale had almost destroyed the orchard it is now in good condition, and the fruit clear of scale. In spraying for the San Jose scale the spray solution also destroys the woolly aphis.

One of the greatest troubles with our fruit growers is that they take up with every humbug that comes along in the way of remedies. The sulpher, lime, and salt solution if properly mixed never fails. It is a good practice to add some concentrated lye to it to cut the sulpher—disolving it with the lime it very often gets burnt which destroys its strength. There has been no remedy found as good as the above. There is no remedy that will destroy the eggs of the scale that will not eat them. We have tried a great many insecticides but nearly all have proven unsatisfactory.

In my travels over the country I have been very agreeably surprised to see so many young orchards growing where a few years ago the land was considered worthless. To-day there are as fine orchards growing there as could be found anywhere, and the fruit growers are well satisfied. The wheat crop has been ruinous to the farmers in general for a good many years. Those that have suitable land for growing fruit I advise to plant winter apples. No fruit will pay as well.

If the legislature, at its next session, will consider our report and grant us further power much more valuable work will be accomplished.

D. M. JESSEE.

REPORT OF SECRETARY.

J. F. CASS.

To the Honorable State Board of Horticulture:

GENTLEMEN — Since I came into the possession of this office in May last my duties have been principally clerical; but during a portion of said time I have also filled the position of Commissioner of the Board for the Third District thereof, and in my report as such commissioner I have entered somewhat fully into a general consideration of such questions as seem to me to be of more special importance to our horticultural interests and of the district itself.

To this report I would add that it has seemed to me that one of the principal duties of the secretary of this board should be to give all such information as may be more or less of a practical nature especially, as well as in the way of theory, upon all questions bearing upon our fruit growing and kindred interests. This should be done, we think, not only in answer to communications coming to the office directly, as correspondence, but also through articles in the public press. In both of these ways my attention has been largely directed.

Besides a comparatively large correspondence, I have since filling the office of secretary, prepared a considerable number of special communications on matters of general interest to fruit growers, and which have been published in our journals having the largest circulation among the rural population of our state. And I would here acknowledge the courtesies of our press extended to the board and myself in this respect.

And in this connection I would also commend the opportunity held out by the meetings of the Farmers' Institutes. These will probably become more and more popular and common in the near future in our state, and will be the means of disseminating much in the line of correct and more progressive methods of culture, etc., in the horticultural art.

Our collection of exhibits as arranged in our board rooms, being made up of specimens of our common and best fruits and other products of our farms and orchards, showing quite generally our resources in these lines, are a source of great interest, not only to visitors here from other states and from abroad, but also to those of the citizens of our own state; and are the means of largely advertising our advantages as a state in general in this line. I would strongly advise the members of the board to take increased interest in adding to such collection from time to time as new specimens could be obtained that might be of special interest. This state in my opinion, from the showing that can be made of these natural products, can very soon, with some increased development, lay claim to be well up with the foremost of our fruit producing states, if not in advance of any of them.

As regards the present and prospective market facilities for our largely increasing fruit production there seems to be opening very encouraging prospects. Shipments are now being made each season from Tacoma to Japanese ports direct, of our winter apples; and as a new venture we have to report also the fact of a recent shipment of our apples to a Russian port, via the Japanese line of steamers. The opening up by the recent construction of railroads, of a vast new wheat producing region of country in Eastern Russia, whose trade is tributary to our ports on the Pacific Coast, will give us a large new field for the introduction of a considerable trade in this class of fruit, and it is confidently expected in the near future. The demands for our fruits from the mining states east of us is also largely increasing.

In this same direction also of finding increased markets for our surplus production of fruit, one of the most encouraging features is in the canning process, which it is confidently expected will be shown to be now within easy reach of producers. There seems to be no well grounded reason against the practicability of the proposition of putting up of our surplus of the small fruits grown here with us in canneries constructed and carried on in a more or less limited way. This we expect, from the information now in our possession, will be fully shown and proven by the experience of another season here on Puget Sound.

Since the establishment of fuller and more direct steamer communication between our ports here and the Orient, now of late there has arisen a new source of danger to our fruit interests from the introduction here of new and very destructive forms of insect and other pests, brought in on plants and trees, and otherwise, arriving on those steamers. I have been in receipt of late of a communication from the efficient entomologist and quarantine officer of the State Board of California, calling attention to the recent landing of some of these pests upon shipments to these ports. I would refer to this as a matter deserving of your watchful attention.

The expenses incidental to this office since my incumbency, outside of secretary's salary, amounts to $16.25, of which sum $9.50 was for postage.

Respectfully
J. F. CASS, Secretary.

REPORT FROM FIRST DISTRICT.

CHATFIELD KNIGHT.

To the Honorable State Board of Horticulture:

GENTLEMEN—In reporting to you the general condition of horticulture in my district for the past year in regard to insects, spraying, trees, crops, etc., I will deal in a general way briefly with the different subjects.

NURSERY STOCK.

Since October last I have examined and inspected both nursery trees and consignments. All nurseries were thoroughly inspected and found in a condition quite complimentary to the owners. Not since I nave been a member of the State Board of Horticulture have I found the different nurseries so clear of insects, and so well kept as the past season. The past season I have examined consignments of trees grown out of the state to a greater extent than any previous year. I don't think that one nursery shipped trees into my district that at least part of the stock was not examined. Permit me to say that of all stock examined since October I failed to find any that was to the least extent either infested or diseased. I am pleased to say that as far as my experience and judgment goes, the law enacted by our last legislature in regard to nursery stock, is just what was needed. The bond and penalty compels nurserymen to send out clean stock.

TREE PLANTING.

The past year tree planting has been carried on about the same as in former years in regard to the number of trees planted, but the work in regard to selection and preparation of the soil has been more carefully looked after. The bulk of the trees planted has been Italian prunes, and apples—the latter mostly late keepers. Quality and location of soil has been taken into consideration more than in former years.

SPRAYING.

I feel safe in saying that there has been three times the amount of spraying done the past fall and winter than in any previous season. Klickitat, Clarke and Lewis, the principal fruit growing counties in my district, have more than thribbled in this line of work. Fruit growers are waking up to the necessity of spraying and cleaning their orchards. During the past winter most of the fruit trees in and around Vancouver have been thoroughly sprayed with the lime, sulphur and salt solution. It appears to me that it is necessary to have all the infested trees in our towns and cities cleaned first. I find that it awakens interest among orchardists throughout the country to clean up these old uncared for trees in our towns and cities. They are breeding grounds for the surrounding country, and until they are cleaned up we cannot expect much work to be done in this line in the country parts.

INSECT PESTS.

Present indications are that with the amount of spraying that has been done our pests, especially the San Jose scale, will be greatly diminished. This scale to my knowledge does not exist in my district, except in Klickitat, and around Vancouver, and the most of the trees infested with this insect have been sprayed the past winter. West of the mountains the wooly aphis is the hardest pest to kill out that we have to deal with. It takes persistent and studied work to conquer them. Some seasons our native lady bugs work on the woolly aphis quite extensively up to midsummer. This occurs perhaps once in three years, and in that season diminishes their number. The lady bug does most of its work while in the larvæ state. If we could get some parasite that would work extensively on this pest every year it would be worth more than all the sprays now used. I am convinced that the natural enemies of all these insects are what we should seek for, and the time thus spent will repay our efforts.

FRUIT CROP.

The season of 1895 was well adapted to fruit growing, and the crop was bountiful except in some localities in Klickitat county, where the grasshoppers did considerable damage. A number of orchards were actually stripped of foliage and fruit. It seems that the owners of these orchards were helpless, and totally at their mercy. The prune crop of Clarke county was well prepared, and larger than common. There were between sixty and seventy carloads shipped of the dried prunes, besides the green product. Prices ranged between 3½ to 6 cents per pound, f. o. b., in boxes. The bulk of the growers, however, received from 4 to 5 cents. The first sold brought the highest prices.

Cherries, with few exceptions, sold to a disadvantage. It seems that the cause for this was that it was difficult for shippers to get carload lots together for shipment, consequently local markets were glutted. Bartlett pears were sold readily at fair prices. Winter apples have commanded a good price since Christmas; in fact the price has increased to this date, especially for No. 1 and No. 2 grades. It is safe to say that taking into consideration the oppression of business generally throughout the country, that the fruit crop of 1895 was well disposed of compared with other products.

CONCLUSION.

In conclusion I wish to state that during the past year selection of nursery stock, location and quality of soil, habits and destruction of insect pests, preparing and grading of fruit for market, etc., have been more carefully studied and practiced than usual. During the past year I have answered over 300 letters directly connected with horticulture, insect pests, fungous diseases, etc. The demand for our last report was fully equal to that of the one previous. Fruit growers are certainly seeking information. I distributed around Vancouver, and in Klickitat county quite a number of the twice stabbed lady bug. Some were sent me by our secretary, and some by Alex. Craw, of Calfornia, and a large number I collected at The Dalles, Oregon. Just what has become of them I am unable to state, but am in hopes they will appear in larger numbers this summer.

CHATFIELD KNIGHT.

REPORT FROM SECOND DISTRICT.

CHAS. H. ROSS.

To the Honorable State Board of Horticulture:

GENTLEMEN—In discharging the duties imposed by custom and prescribed by legal mandate, I shall first speak of a subject which seems uppermost in the minds of the great struggling mass of husbandmen to which our peculiar duties bring us in contact.

The severe test of the past three years, following upon a period of previous prosperity, unchallenged credit, profitable industry, and firm prices, has paralized every branch of industry, causing suspension of credit, stagnation of enterprise, a shrinkage of fiscal as well as productive values. Possibly no class of our people has been more materially affected than our horticulturists. This occupation being that of a producer of the material wealth of the state. The extravagant provisions of our state constitution in the administration of our executive, legislative, and judicial affairs has been keenly realized by every one, but by none more severely than the man who is trying to meet interest, taxes, and forge for himself a home in the new west.

This depressed condition of affairs does not alone affect the people of our state but every other state of our great Union. One thought should permeate us as we endeavor to fulfil the functions of our respective positions, and that is to keep the fires of hope burning brightly through the dark hours. True, it takes courage and nerve to withstand the financial shock through which we are passing, and which has so recently shaken up the whole country.

But the heavy cloud which has hung so like a pall over this country is beginning to lift its dark shroud, till we begin to see the sunlight of hope breaking through its ragged edge. While this evolution is taking place it is befiting that no effort be left unimproved in endeavoring to cheer the discouraged, and get them to keep step to the tune of the better days to soon come. The patriotism, ambition, and courage of every son of toil should be cheered and encouraged just now. If markets are doubtful, prices low, and crops unpromising, so much the more need of industrious and courageous effort.

According to the provisions of our amended law I have visited every county in our district, except one, and that one I expect to visit soon. Complaint was sent in from Thurston county that some of the best orchards south of Olympia were dying. Upon visiting the county I found that the acreage of fruit had been largely increased. I found the trees mainly affected to be the Italian prune. After holding a meeting and consulting with the best horticulturists, I learned that the trouble was largely local and climatic in nature.

Last March after the trees had begun to bud we experienced one of the most severe cold spells. It being noted that while our trees were well along in the bud the weather was cold enough to freeze the water pipes, a very unusual thing for this country. It was also noted that the trees on the highest, lightest soils were the most affected. While along the water courses and on heavier soils they were apparently free from any trouble. Whether this affection was due to the fact that the trees on the higher lands had started their sap and were caught in the freeze, or whether the drought on these upper lands the previous season had weakened the cellular tissue that it could not withstand the cold, was not definately determined. But after a careful examination and conference with those most familiar with the conditions, and after having visited a district similarly affected in Kitsap county, we became satisfied that it was a combination of the above causes which brought about the trouble. It might be well to note that these conditions are not likely again to occur in a dozen years—that of extreme drought, followed by extreme cold.

The same trouble was found in Kitsap county in a large orchard of prunes—the prunes apparently being the most affected. The conditions of soil were found much the same as those in Thurston county. While on the lower lands along the Sound, where the soil was heavier, the fruit trees were in excellent condition.

During the year I have visited in Pierce, Thurston, Mason, Chehalis, Kitsap, and Clallam counties, I find the people wide awake and enterprising. They have all felt the effect of the prevailing hard times to a marked degree. I found the fungous diseases, and wooly aphis, green aphis, and oyster shell scale the principal insects which trouble the orchardists west of the mountains. In all the counties visited meetings were held with the fruit growers, and talks given on insect pests and their remedies. Also upon the planting, cultivation, and pruning of trees.

At many of our meetings the subject of picking, packing, and grading of fruit was taken up. Local organizations were formed at Elma and Montesano, Chehalis county. Also one was formed at Sequim Prairie, Clallam county, and one at Dungeness. In Pierce county, one at Puyallup, and one at Edgewood. In Pierce county there has been no great extension of orchards in the last two years. Our crops being very light in all kinds of fruit has caused a sharp advance in prices.

Four years ago a large acreage in Pierce county was planted in small fruits, but owing to low prices many fields of both raspberries and strawberries were neglected or destroyed. This season we find a shortage in small fruits and consequently high prices. There has been shipped from Puyallup between twelve and fifteen thousand crates of small fruits during the last two years, mostly raspberries and blackberries. Most of this fruit was shipped to points east; to points along the railroad into Idaho, Montana, the Dakotas, and even as far east as Chicago.

A growing interest in small fruits is manifest. The Evergreen blackberry is commanding considerable attention, as it is an immediate successor to the common blackberry. The Evergreen is very productive, and when fully ripe is quite palatable. The Logan berry, a new berry propogated by a Mr. Logan of California, and introduced into the state by Mr. Thos. P. Cantwell of Puyallup, is a new berry, a cross between the Cuthbert raspberry and the blackberry. This new berry is also attracting a good deal of attention. It has the flavor and colour of the raspberry, while it has the form and solidity of the blackberrly As it is very productive it deserves a fair trial. Mr. Cantwel. seems to think it a berry of great promise.

The hop crop which has been the source of so much revenue to the people of Washington, has been badly neglected during the past few years from the fact that the price was below the cost of production. Hence a crop which has been valued at over a million dollars annually to the people of the State of Washington has yielded us practically nothing during the past two years. The potato crop is good, and vegetables generally have done well. The celery crop is exceptionally good this season.

The west side experiment station, of which the board has taken such great interest, has become a fixed fact. Nearly two years ago twenty acres of choice bottom land was sold the state near Puyallup, and forty acres more donated conjointly by D. M. Ross and C. H. Ross, making in all sixty acres, composed of quite all varieties of soil found west of the mountains. This new station has been called the Ross Station, and is under the direct control of the regents of the Pullman College, with Professor F. A. Huntly as superintendent. It is to be hoped with their splendid combinations of soil that some valuable and interesting experiments will be made.

With our soil, climate, and peculiar location geographically, and knowing of the excellent advantages of our state, both as a growing locality and as a shipping point, we have invariably urged upon our people the necessity of planting of commercial orchards; also of planting fewer and better varieties, so that we may pick up a car load of any variety that may be in demand. We have urged upon them to plant only the thriftiest and best varieties, and then to cultivate and prune severely at the start, that their trees may be able to carry the weight of fruit in later years. We have urged that they grade their fruit carefully, and only send the best grades to market.

In spraying we have tried to classify the insects in such a way that there would be no difficulty in selecting the right solutions. Yet we constantly find the people making blunders along this line. They are as likely to use the Bordeaux mixture for the green aphis, or the Paris green, as they are to use the Quassia solution. Here we classified the insects into three classes:

1. The aphides, which take their food through sucking tubes, and feed on the sap of the bark.

2. Aphides, which take their food through sucking tubes, and feed on juices from the leaf.

3. The insects which chew like the cow.

In all these talks showing why the insects which take their food through sucking tubes cannot be destroyed with an arsenite, and why the insects which chew cannot be killed with an alkaline. We emphasized the remedies for the fungous diseases. In Whatcom we were invited to attend the farmer's institute. We learned that some of the orchards had been sprayed with the bluestone solution for the green aphis. In Thurston county we found that they had been spraying the cabbage aphis with a lime preparation. Thus ignoring through lack of attention the remedies suggested by the board, and of course spraying without effect.

We here would emphasize the fact that we find the woolly aphis one of the worst insects to contend with west of the mountains. Last spring we made a special raid on the aphis of Tacoma, and were truly astonished to find so many trees affected. Still there is much work to do. Notwithstanding the repeated notices to our fruit dealers, warning them against dealing in infested fruit, we are frequently confronted with the fact that while a large majority of the dealers are working with us, many are indifferent. This matter should receive our careful attention. We would again suggest that proper solutions be recommended, and only those that have given the best satisfaction.

SUGGESTIONS AND CONGRATULATIONS.

In looking over the work of the board for the past two years, we can congratulate ourselves on the fact that we have accomplished some good, and have many friends among the fruit growers. We have circulated over 20,000 copies of our reports, full of the experiences of the best horticulturists of the state. Through the efforts of our board the North West Fruit Grower's Association was established, whose salutary and remunerative influences have been felt all over the northwest. The establishment of the West Side Experiment Station was the result of the concurrent labors of the members of the State Board of Horticulture.

We have much work to do in the future. Let us work unitedly as we have done in the past. The matter of encouraging agricultural industrial fair associations in each county of our state seems to be a matter of paramount importance.

CHAS. H. ROSS.

FROM THE THIRD DISTRICT.

J. F. CASS.

To the Honorable State Board of Horticulture:

GENTLEMEN — The State of Washington is a huge experiment station, in which has been more or less since its early settlement, thoroughly tested in a practical way about all the different fruits and horticultural products that would seem to be adapted for cultivation upon its varied soils, and in the different sections and localities of the state, and in which very diverse climatic and other conditions exist. The experience of the cultivators of the soil — practical men, whose work is often two-fold more valuable in many cases, because being the combined results of a good theoretical and practical understanding of the work — is freely within the reach of the observer who would profit from it.

DUTY OF THE STATE BOARD.

To collect and put into shape this practical information for the benefit of the people of the state at large should be one of the principal aims and objects of this board.

LABORS OF DIFFERENT SPECIALISTS.

No paid government experiment station work, of great worth though it be, could ever compare in value to the work of many in special agricultural and horticultural lines in the state that might be mentioned. Such as that of Meeker in connection with the hop industry. And that of one of the pioneers of fruit growing on Puget Sound, John Bennett, of Whatcom county. And we might refer to others in the state in their special lines of work, being experts in certain branches of production, as examples of this fact.

PROGRESS IN SPRAYING, ETC.

We have to note much progress in horticultural work during the past two years in this district. A very much better understanding is now had of the various insect and fungous pests against which the fruit grower has to contend. And such understanding begets confidence on the part of the grower in his ability to guard against their ravages. The salt, sulphur and lime solution spray, applied early in winter to the trees, to be followed with a strong solution of sulphate of copper before the buds open in the spring, has been found in general to be the best protection to all the tree fruits from most of the injurious pests. Of course, to ensure perfect fruit and clean foliage, the Bordeaux mixture must be used during the growing season also. These sprays may now be said to be indispensable here on Puget Sound. The increasing spread of the various fungous diseases of the leaves and fruit, and also of the "dead spot" of the bark disease, is very marked where these sprays are not used. It has been demonstrated that fungous diseases, so wide spread and common to our Puget Sound region of country, may be kept well in check by a judicious and thorough use of these sprays.

THE DIFFERENT FRUITS.

Considerable advance has been made in our knowledge of the different varieties of fruits, and their adaptability to different localities and conditions.

THE CHERRY.

The Bing, and perhaps some other of the larger new varieties of the cherry, will in all likelihood take the place to a great extent of the other sorts now cultivated for market purposes, as their increased size and superior appearance will command for them enhanced prices. The cherry seems destined to occupy a prominent place as a profitable market fruit here on Puget Sound.

THE APPLE.

A desire to try many kinds leads most growers of the apple to have too many varieties in their collection. There is such a wide variation in the value of the different kinds for planting on Puget Sound, as should lead the orchardist to the wisdom of keeping his list a very small one. In the eastern and more elevated portions of the state, the conditions that make this course so desirable here, does not obtain to such a great extent.

THE PEAR.

More experience in growing the pear here on Puget Sound, we think, is required to enable the grower to decide which, under the conditions found here, would be in general the best varieties to plant. The growing of this fruit on the quince root as a dwarf should have more attention also, we think, on the Pacific Coast region.

THE ITALIAN PRUNE.

Increased experience in the growing of the Italian prune here is rendering it doubtful to many whether in a series of years this fruit will be a profitable one as compared with others of the tree fruits. One thing is certain it may be said, that except the trees are grown on a deep strong soil, this fruit will not be a desirable one to grow here for market purposes. In too many seasons the crop is a failure because of the prevalence during the blooming period in the spring, of cold, rainy and damp weather, preventing pollination. However, on proper soils, this fruit sometimes produces with us enormous crops of a fine quality.

THE PLUM.

The growing of some of the plums for shipment east in the fresh state offers considerable inducement. Especially is this the case with the Pond's Seedling variety (Hungarian prune), because of its large size and fine appearance, and good shipping qualities. This sort is also an extra productive one. The planting of the Japanese varieties, introduced a good deal of late, does not seem desirable, as they seem to have no qualities to recommend them over the better European kinds.

NEW VARIETIES OF FRUIT, ETC.

The desire and inclination, often common, especially among the more inexperienced cultivators, for obtaining new and highly praised varieties of fruits and vegetables, is greatly encouraged by a certain class of "rural" journals, and nursery and seedsmen, whose catalogues glow with marvelous descriptions and illustrations of outlandish and wonderful creations. Such forms of advertising should be relegated to the more legitimate circus poster methods. In this day of the general spread of information, it would seem quite unnecessary that the farmer and fruit grower should be the common prey and dupe of swindlers in this respect.

MORE INTENSIVE CULTURE NEEDED.

The obtaining of extra high prices in our markets for extra choice specimens of fruit (apples, of an extra high grade, having sold in our cities the past season as high as $3 per bushel box) will call attention to the advantage of giving more care and intensive culture to the production of such high class fruit. We believe that the next decade will show a great advance in this line, especially, in this state.

THEORY VS. PRACTICAL KNOWLEDGE.

One peculiar feature of the calling of the cultivator of the soil is that people from every walk of life become his teacher and guide as to the details, and everything pertaining to his line of work. Thus agricultural and horticultural journals and books are often edited by those, who while they may have some theoretical understanding of the art, are totally wanting in practical knowledge of the kind. Of course text books are of the greatest value to the learner. But if these are compiled and made up by those who have only a hazy and general understanding of the subject treated upon, such must necessarily be wanting in their chief elements of worth. And one having only a theoretical knowledge of an art is a very poor teacher and adviser. Unless the reader learns to distinguish between that which is practical, and such as may be mere generalities, a great deal of the published rural literature will be found to be more misleading than otherwise.

MISLEADING INFORMATION.

Many writers and others having a zeal for and working in the interest of our state in the way of bringing to the attention of the public our generous natural resources, and for the purpose of inducing immigration hitherward, quite commonly make statements that are misleading and too strong in fact, to say the least. While admitting that the soil in some localities in our state is of such a character as to be not adapted to the production of crops of grain or grass, yet maintaining that such soil is both good and well adapted for the growing of fruit, such statements are, from a practical point of view, very erroneous. The domain of the real estate boomer should be entirely distinct from the field of the practical and successful fruit grower.

PROPER SELECTION OF SOIL, LOCATION AND VARIETIES.

If there is any one thing that the prospective fruit grower should give more attention to at the outset (aside from the choosing of proper varieties) than to the selection of his location, as regards the soil upon which to establish his orchard, it has never appeared to me. Of course, the proper selection of varieties is in many respects a point of the first importance, as no one can expect to succeed or make profitable the growing of fruit except he grow such as the market demands, and plants such kinds as succeed in his location. Yet by top-grafting the trees an orchard may often be profitably be changed afterwards to other varieties, if these are not right at first. But if the soil of the orchard is inferior, or not suited for the fruit or trees planted in it, either from its general sterile character, or in other respects not adapted to the purpose—as certain of the fruits will not succeed to any desired extent unless the soil is peculiarly suited to their growth—the orchardist will find that his investment will nearly surely be a failure in the way of profit. The reclaiming of lands that are naturally unsuited for fruit growing is here, with our high priced labor and other elements, a venture that will hardly or never be found a profitable one. It is on the two lines above noted, we think, that most of the failures in fruit growing, otherwise intelligently carried on, in our Puget Sound country will be found.

SELLING ORCHARD PRODUCTS ON COMMISSION.

The question of making sale of his product is always a troublesome one to the fruit grower. The consigning of his crop to the commission dealers in our towns and cities for sale has been found in general very unsatisfactory. When the commission dealer refuses to account to the consignor in detail, showing to whom sales were made and the prices obtained, (as required by our statute) naturally the producer feels that he has been wronged in the transaction, and often no doubt, were the facts obtainable, not without good grounds for such belief. As the principal is in any such transaction in all justice entitled to the fullest information as to the selling of his goods by the agent, such refusal on the part of the commission dealers, and the combinations entered into by them at some points to interfere with the ordinary operations of the natural laws of supply and demand as regards these products, is deserving of the severest censure.

J. F. CASS.

REPORT FROM THIRD DISTRICT.

A. J. M. HOSOM.

To the Honorable State Board of Horticulture:

GENTLEMEN—I am not here to make excuses for my report. Having just received my commission as a member of your body I have therefore had little time in which to gather *data* in the district which I represent.

From the 2d of July to the 15th of August last, I visited portions of Whatcom and San Juan counties on account of private interests. The people there seem inclined to pursue the art of horticulture along commercial lines. In the near future large plantations of cherries and winter pears are sure to be established on the northern shores of Puget Sound. I have recommended the former on the grounds that, in the light of experience ranging over a period of thirty years, cherry culture has proven a success. And as ours is the highest latitude on the continent in which this noblest of all soft fruits finds a most congenial home, our cherries must be the latest therefore, when shipped to eastern markets, meet a sharp demand, ready sale, and no competition.

In our soil and climate it is my humble opinion that large tracts should be planted to pears. But a thorough system of inquiry should be instituted regarding the supply on the coast, and probable future demand in eastern markets. After summing up all the information I have been able to gather on this subject, I am forced to the conclusion that the coast is now producing a supply of summer and fall varieties, equal to the highest capacities of local canneries and shipping demand. There is a field in pear culture however, which, from a commercial standpoint, has never been touched. Along the shores of Puget Sound we harvest winter pears in the month of December. This fruit can be shipped to eastern markets in the month of February, during which season pears are a novelty. In no other section of this great country can this statement ever become a fact.

In my district a great deal of study and attention has been given to insect pests and fungous diseases, and much reading and discussion on the subject of future markets, but in no section has this been so marked as in the counties where local societies have held horticultural fairs.

In Island county we have a live society, every member of which honors the state board for its organization. In my humble opinion the State Board of Horticulture will never attain its highest aims until live organizations are established in every county in the state.

In my experience, the great difficulty attending the organization and management of local societies, lies in teaching the infant to walk the first year of its existance. I have observed, however, that wherever fairs have been held, the people have been surprised at the beauty of their products when placed on exhibition. I am convinced therefore that the annual show is a necessity. Emulation is the stimulus, with which we cannot dispense. Mr. A. will not climb to the highest rung of his ladder after work hours if no one is to admire his big red apples; and the English lord will not ride his best hunter over a dangerous ditch when nobody is there to see. Large and lovely are the pears of Mr. Jones, but never so large, never to lovely as when they rest beside the pears of Mr. Smith, having won the grand prize.

Last year our local society held a fruit show for a half day; every member was delighted. We have just closed a three days' fair, distributed among our members $1000 in premiums, including a year's subscription to 192 journals on horticulture and kindred subjects. These publications cover a field in area from Boston to San Francisco. We shall have information from every fruit district, from every latitude in our country. We hope to be in a position to plant practical horticulture on a foundation as permanent as the soil itself. The reciepts of our fair were sufficient to pay all bills and leave a balance sufficient in cash to purchase the building, which is eighty feet long by thirty feet wide. We own our property unincumbered.

Our society has a bright future, and instead of 900, we anticipate 1500 entries in the fall of 1897. If we base our anticipations on experience, we shall have nearly twice the entries at the cost of one-fourth the effort expended this year. At the close of our fair, we graded and packed the fruit in neat packages and shipped it to St. Paul, Duluth, and Chicago, for exhibition purposes.

I have spoken somewhat at length of the fair held by the Island county horticultural society, but with no thought of boasting. I have introduced the subject as an illustration only to convey to you an idea of the robust health and financial dignity of an institution, founded two years ago by members of the State Board of Horticulture.

We followed your instructions diligently; we drilled regularly, and when the command was given to fire on the enemy, we marched to the front with spray pumps for guns and poison for bullets. We succeeded in repulsing the foe, but the fight continues and shall ever continue until we are enabled to sell fruit of large, uniform size, and free from imperfections, in the best markets of the world.

In the near future we shall see every package of fruit carefully graded, correctly named and branded with the name of the producer. In a very large degree, the commercial value of all commodities is figured on the brand. This is a very important subject, and demands the closest attention by the local societies.

A. J. M. HOSOM.

REPORT FROM FOURTH DISTRICT.

S. W. MAXEY.

To the Honorable State Board of Horticulture:

GENTLEMEN — Since our last biennial report I have labored to promote the interests of horticulture by practical illustration and by close observation throughout my district. I have worked along the line of planting, pruning, training, cultivating, and irrigating fruit trees. Much advice pertaining to these topics have been asked me, and such has been given to the best of my ability. In the line of propogation, fecundation, and pollenization of trees and fruit, my study and observation has been largely extended. We are explorers in this field, and what we discover by experience and observation we should make public. And efforts in this line it seems to me are worth more than always pulling along in the same old ruts. Theory is the highway of knowledge, from which the observer turns to the right or to the left, and plucks the flowers, and sips the nectar of wonderful discoveries. There is a grand field of study and discovery in store for us as members of the State Board of Horticulture.

In the last two years I have visited each county in my district from one to five times a year, and have found many insect pests. In Yakima county I have found the San Jose scale, woolly aphis, and green aphis. In Kittitas county I have found the oyster shell bark louse, and the green aphis. In Douglas and Okanogan counties I have found only the green aphis. Spraying has been done with vigor in each county in my district; and with success where the formulas were carefully compounded and properly applied. In Yakima county the lime, sulphur and salt solution has proven to be the most effective remedy known to exterminate the San Jose scale. It has also been verified that the green aphis is a comparative stranger where this solution has been used annually.

During this year I have visited a great many orchards and fruit gardens, too numerous to mention, most of which are in prime condition. Douglas and Okanogan counties are taking the lead in the care of their orchards. I think that the San Jose scale will soon be eradicated from Yakima county, as the orchardists there are making a hot fight. I was pleased to find the nice fruit of Yakima county on exhibition at the state fair clean of any appearence of the scale. I am sorry to say, however, that among the insect pests above mentioned in Yakima county, they also have the Codlin moth. The persistant spraying and the hot weather have made a great advance in the destruction of the green aphis all along the line, many orchards being entirely free of them.

In Douglas and Okanogan counties there is a live interest taken in fruit growing, although isolated from markets or shipping points. Each of these counties have a horticultural organization, and each organization has an annual fair or fruit show. The one in Douglas county is held at Waterville, and is held in a large structure made for a skating rink. The one held in Okanogan county is held at Chelan. This year the Okanogan fair was in October, on the lake front in a grove. Never before in my life have I found such a manifestation of real interest in a fruit show. Three hundred and fifty dollars in premiums were paid out on awards, and about the same amount was paid out at Waterville. The organizations are self sustaining institutions, and worthy of commendation. Each of these fairs were held just before the fair at Spokane, and the exhibits were sent to Spokane and helped to swell the exhibits there.

The following figures of the shipments of fruit from the Yakima valley, at the different stations along the line of the Northern Pacific railroad of the year 1896, in my district, as handed me by S. G. Fulton, general freight agent, are given: Ellensburg 238 packages, North Yakima 22,513 packages, Yakima City 2,821 packages, Simcoe 22,057 packages, Toppenish 2,342 packages, Kiona 10 packages; total 49,981 packages. Last year (1895) more than duplicated these figures.

And the following are the figures of the fruit shipments made the present season from Wenatchee, as furnished me by Mr. E. L. Thompson, agent of the Great Northern railroad at that point, being the fall shipments, the main crop of winter apples and pears not having gone out yet: Peaches 35,000 boxes, apples 3,800 boxes, prunes 4,500 boxes, apricots 2,250 boxes, grapes 1,300 boxes, other fruit 1,475 boxes; total 48,325 boxes.

With our fruit industry yet in its infancy we may readily see what our fruit crop will be worth to the state in a few years. Other points in the state figure by the car load. The price of fruit has been pretty fair this season, and with the building up of trade with Alaska, and with the increased development of our own state, and the establishment of new ship lines to the Orient, we need not fear for over production of such fruit as good late shipping varieties of apples and pears. A large trade is sure in these fruits.

S. W. MAXEY.

REPORT FROM SIXTH DISTRICT.

H. H. SPAULDING.

To the Honorable State Board of Horticulture:

GENTLEMEN—During the past two years, considering the financial depression, the horticultural industry of Eastern Washington has prospered and improved, although prices have been low as compared with former years.

The fruit growers have been greatly benefitted by our horticultural board, and also very largely by the annual meetings of the fruit growers' conventions that have been held at different points. It has brought the shippers, the commission men and the managers of the different transportation companies together, by which means the producers and shippers have secured very fair shipping facilities and services, considering the newness of our state.

The orchards, as a rule, are healthy and thrifty, and free from injurious pests, with the exception of green aphis and the Codlin moth, which in some places cause more or less trouble. The few orchards that were infested with the San Jose scale have been freed from the dreaded pest by the use of the salt, sulphur and lime solution, which is a sure remedy if properly applied. Quite a number of new orchards have been planted out the past season, mostly to apples, and arrangements have been made to plant out several hundred more acres the coming season. The apple crop of 1896 was not up to the average, on account of the unusual hot term of weather that we had in the month of July. The peach crop, while not as heavy as in former years, was a fairly good crop. The crops of other varieties of fruit were fairly good ones also.

The following is a partial list of the number of acres in fruit in this district, as furnished me by the auditors of the different counties, and taken from the assessors' books. As many of the deputy assessors did not secure a correct list, the amounts given are considerably below the actual number of acres out in fruit.

STEVENS COUNTY.

The assessors of Stevens county failed to list the number of acres out in fruit in their county. Stevens county coutains quite a number of fine bearing orchards, and a large number of young orchards not yet in bearing. From the exhibits shown at the Spokane fruit fair, Stevens county can produce as fine fruit and vegetables as any county in the state, and will be one of the leading fruit producing sections of the state.

ADAMS COUNTY.

Adams county, being mostly a grazing section, and having but little running water, has but few orchards. But wherever water is to be had all kinds of fruit do well.

SPOKANE COUNTY.

Number of trees as shown by the assessors' books in Spokane county are as follows:

Apples,	under	5	years,	1642	acres,	Over	5	years,	714	acres.
Prunes,	"	5	"	284	"	"	5	"	178	"
Pears,	"	5	"	135	"	"	5	"	108	"
Plums,	"	5	"	218	"	"	5	"	92	"
Cherries,	"	5	"	120	"	"	5	"	99	"
Peaches,	"	5	"	5	"	"	5	"	4	"
Grapes,	"	5	"	3	"					

Small fruit, 109 acres.
Total number of acres in fruit, 3688.
Number of persons engaged in fruit growing, 563.

Mr. E. P. Gilbert, deputy inspector for Spokane county, claims the above list, as furnished by the county assessor, is too low by 33 to 50 per cent. Spokane county has at least 6,000 acres out in fruits, mostly apples. Some of the largest orchards in the state are to be found in Spokane county, and many new apple orchards are being planted out. Mr. Gilbert reports the orchards in his county as being in a healthy condition.

LINCOLN COUNTY.

The assessors' books show 1128 acres in fruit in Lincoln county. The same complaint is made in Lincoln county about incomplete lists as to the amount planted out to fruit. This county has at least 2,000 acres planted out to orchards. It has a number of fine peach orchards and vineyards. All kinds of fruit do well in the county. Mr. Robert Neal, deputy inspector for Lincoln county, reports all orchards in the county to be in a healthy and thrifty condition. In this county along the Columbia river bars, are to be found fine peach orchards. All kinds of fruit do well.

WHITMAN COUNTY.

The assessors' books show 2973 acres planted out to fruit, and which is too low by about one-half. It places the total amount in peaches at 94 acres, while there are at least 400 acres in peaches, and 800 acres out in prunes. At a low estimate there are 6500 acres planted to fruit in Whitman county. Arrangements have been made by the Burrell estate to plant out several hundred acres to apples alone, the coming season. In Whitman county can be found quite a number of prune (large) orchards which are just coming into bearing, and along Snake river are some of the finest peach orchards, and vineyards of the grape, to be found in the state. Below is a list as furnished by the county auditor:

Apples,	under 5 years,	805 acres;	Over 5 years,	722 acres.
Prunes,	" 5 "	308 "	" 5 "	114 "
Peaches,	" 5 "	21 "	" 5 "	73 "
Pears,	" 5 "	56 "	" 5 "	42 "
Cherries,	" 5 "	20 "	" 5 "	92 "
Plums,	" 5 "	29 "	" 5 "	35 "
Grapes,		33 "		
Small fruits,		160 "		

Total number acres in fruit, 2973.

In conclusion I would say that there is a growing interest in the fruit industry in this district. Many new orchards, mostly apples, will be planted out the coming season. The Spokane Fruit Fair, which was held in Spokane during October, was grand success, and proved from the beautiful collection of fruits and vegetables on exhibition, that the people of Eastern Washington are greatly interested in horticulture and fruit growing, and are beginning to realize the benefits to be derived from these fruit fairs, and which are one of the best educators of the fruit grower. And it also brings the producers, and the consumers, with the dealers, together, and all who are interested in our great state. One of the best collections of fruit at the Spokane fair was from British Columbia, grown on the Frazer river.

There is a considerable inquiry from time to time made in regard to the best fruit dryers. As there are many inventions and kinds, each claiming to be the best, it would be difficult to say perhaps which is the best, and also not wise to recommend any particular one.

The tomato blight, that has been so destructive for the past few years, has entirely disappeared this season in this district.

The North West Fruit Growers' convention, which is held annually in different parts of the state, should be encouraged by the fruit grower. It has already proven to be a benefit largely to all interested in the fruit industry in many ways. The National Fruit Growers' Union, established at Chicago last spring, promises to be a great benefit in the way of the marketing of our fruits in the eastern markets and should be encouraged.

H. H. SPAULDING.

REPORT OF COMMISSIONER FOR THE STATE AT LARGE.

L. CHEADLE, ADELAIDE.

To the Honorable State Board of Horticulture:

GENTLEMEN—As a member of the state board since our last meeting in April last I have visited a large number of the fruit growers of King, Snohomish, Skagit, and Whatcom, and a small portion of Island county. I found the newly planted orchards were less affected with fungous diseases, and in much better condition, as the fruit was free from scab. But the cherry orchards were badly affected with the *Gummosis*, especially where the land was clay and not properly drained. I invariably recommended the removal of the gum, and slitting the bark where the gum was removed, and the application of a strong solution of bluestone. I also recommended the use of the Bordeaux mixture in the spring, and also the winter solution (lime, sulphur, and salt). When applied I think there should be a reasonable amount of the Bordeaux mixture used with the above solution, as it saves much time and labor by so doing.

I also found amongst the fruit growers who had planted orchards for commercial purposes, a far more extended interest manifested, especially in the matter of cultivation, varieties of fruit best adapted to this climate, together with the best class of soils to be planted. To be the most successful the recommendations of the most experienced fruit growers of Western Washington should be followed out as near as may be, as our climate and soils, and other conditions, are widely different from those of Eastern Washington; in fact as much so as if we were separated a thousand miles apart. Hence the necessity of the establishment of the experiment station in Western Washington; and it is very gratifying to know that the people of this portion of the state will, in the near future, be greatly benefited by this institution and which is now in a fair way of development. The station is not only favorably located, but embraces the different classes of soils within its metes and bounds.

THE CULTIVATION OF THE CHERRY IN WESTERN WASHINGTON.

I believe from past observation, and the experience of the last twenty-four years in Western Washington has convinced me that this portion of the state is the home of the cherry. I would recommend only the planting of varieties known to be suitable for shipping purposes. The black republican, Bing, and large red Proll, which are prolific bearers, are among the best. The last two named are unusually large, often an inch in diameter, which makes them very desirable for commercial purposes.

PREVENTING SPREAD OF INSECT PESTS.

I have within the last two months or more been very vigilent in watching the fruit market, especially the apples shipped into our cities on the Sound, and especially into the Seattle market. And I have found quite a large amount of the apples shipped from California very wormy (Codlin moth), and I condemned all the fruit found infested. I allowed the consignees to re-ship the wormy fruit to Alaska, as there would be no injury resulting therefrom, and at the same time protecting the interests of the state. I also found two car loads of apples from other points, that were more or less affected with the Codlin moth, and allowed them assorted under my directions, and the infested fruit to be shipped to Alaska or to be consumed at the hotels and restaurants of the city. But I have warned the shippers of California, Oregon and Eastern Washington, through agents or superintendents of freight of the different transportation companies who may receive fruit, especially apples, consigned to Puget Sound ports, to require of said shippers or consignors of said fruit, to guarantee the freight both ways, in case such fruit should be found wormy upon inspection.

This has led to good results, and from the last two steamers the apples have been found free from insects. And from now on I believe we will be protected, as the commission men are apparently anxious not to deal in that class of fruit, and have wired their agents at San Francisco, and elsewhere, not to receive fruit unless guaranteed to be uninfested. Most of the fruit dealers, I think, were anxious to see the requirements of the law fulfilled, but some of them I am satisfied were disposed to look upon the matter as against their interests financially, and hence did not fall in very readily with the idea of cutting off their commissions, as they did not know to what extent it might lead to. And as eternal vigilance is the price of success we will have to keep constant watch and guard upon the different ports of the Sound. L. CHEADLE.

PRUNING ORCHARD TREES.

BY PROF. J. A. BALMER, HORTICULTURIST, PULLMAN AGRICULTURAL COLLEGE.

Before proceeding to a discussion of the subject in hand, a few remarks on the general principles underlying it may not be out of place.

WHY DO WE PRUNE?

We prune to induce fruitfulness, and we prune to diminish fruitfulness; we prune to increase wood growth, and we prune to decrease the same; we prune to shape the tree and to make it conform to our idea of a perfect and beautiful tree.

Without entering into the subject of vegetable physiology, which we would need to do in order to explain the causes leading to certain results, I would ask the reader to accept as true the statement that all forms of summer pruning the limbs tends to diminish wood growth, check, or retard, the luxuriance of the tree, and induces it to form fruit buds where only leaf buds might have been formed.

On the contrary, all winter pruning of the limbs encourages wood growth, and tends to prolong the life of the tree.

All forms of root pruning have a similar effect to summer pruning, in that it tends to diminish luxuriance in the tree and induces earlier fruiting.

Now, if these statements be true, and they will not likely be denied, it follows that we have only to consider the condition of our trees, and apply the remedy to bring about desired changes.

But here is the stumbling block.

Every man has his own ideas of *pruning*. We have those who advocate the practice of going through the young trees early in the summer, and with finger and thumb pinching off all superfluous shoots, correcting the growth as it appears, and training the tree in the way it shall go.

We have others who say, "Nature knows more about growing a tree than I do, and I don't want any pruning in my orchard."

Still others who are regular tree butchers, and at every possible opportunity are found sawing and hacking their trees, until there is very little tree left. And then we have the man who prunes only when occssion seems to demand it. Something has to be done, so he *prunes*.

Now, what the orchardists of Washington need more than anything else is, first, a knowledge of the principles underlying fruit and wood development; and, second, a system of pruning adapted to his part of the state.

For what would be a perfectly proper course to follow on the west side of the Cascades would be ruinous on the east side. For instance, it might be eminently proper in Western Washington to follow a system of summer pinching and winter root pruning to induce unfruitful trees to bear, and also to keep them dwarf and their roots within bounds. The climate west of the mountains would favor such a proceeding, where the trees make timber instead of fruit and where the subsoil is everywhere saturated with water, whereas to adopt a practice of this kind anywhere east of the Cascades would be little short of suicidal.

Now, in a few plain words allow me to draft a system of pruning that may be advantageously followed on either side of the range.

Commence with a yearling tree. I say yearling tree, for the reason that if I buy a two-year-old it has invariably been spoiled by the nurseryman's knife by the practice known as *trimming up*. You don't want a tree that has been trimmed up, otherwise you will make the first great mistake in orchard practice.

You want a yearling tree that has never had a knife laid on it since the graft was made—a simple switch with all the buds nature provided still intact. Now you are in shape to lay the foundation of a beautiful, shapely, long-lived tree.

Plant your switches where they are intended to remain permanently, and after all are planted at proper distances, and in straight rows, proceed to head them back.

Yearling trees, as usually found in our nurseries, are from two to six, or even seven or eight, feet high. Now, to allow nature to follow her bent in a young tree of this kind, you would have as a result of the second year's growth a number of limbs at the top of last year's switch. This is the kind of tree usually seen in orchards, and this is the kind you want to avoid in planting.

LOW-HEADING!

Is the watchword for all planters in a country where the sun is powerful and the air dry, as is the case in Eastern Washington. Low-headed trees have all the advantages and none of the defects of high-headed trees in any country.

They can be pruned for the first four or five years (and these are the years when the bulk of the pruning ought to be done), and the earlier crops of fruit can be gathered without the aid of a step-ladder.

They are down out of the wind, to a certain extent. They shade the ground, thereby conducing to root growth by conserving moisture.

There is no long bare trunk exposed to the hot sun's rays, drying winds, borers, etc. And lastly, one can cultivate nearer to a low-headed tree and not interfere with the limbs, as is the case in high-headed trees left to nature's ways.

This latter point has been disputed by people who cannot understand how it is, and who have never seen a shapely, well pruned, low-headed tree. Yet it is none the less true. You can work the land as near to a low-headed tree as you can to a high-headed one.

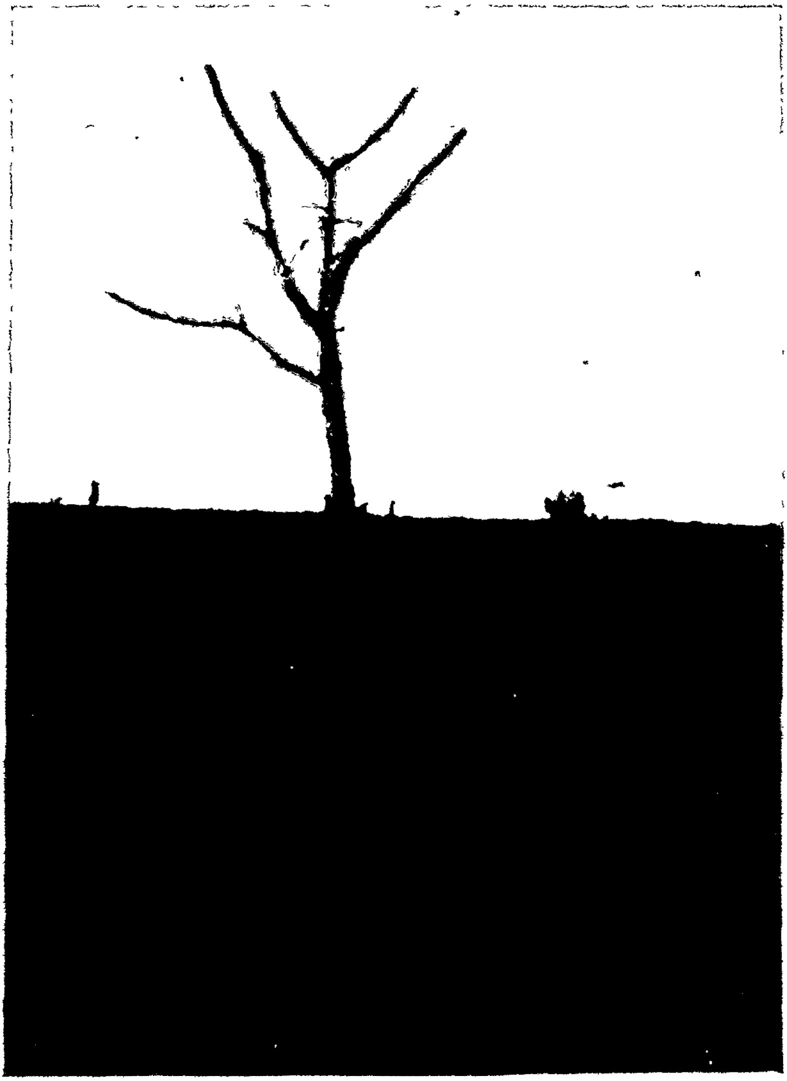
Low-heading admits of degrees, 'tis true. Some would consider four or five feet from the ground a low head, but twenty inches to two feet would be a better height at which to establish the frame of your tree.

As a rule, all apple, pear, and sweet cherries, ought to be headed not higher than twenty to twenty-four inches from the ground, and all stone fruits, such as plum, prune, apricots, peaches, nectarines, etc., may with advantage be headed a little lower, say twelve to fifteen inches from the ground.

Aim to establish a system of limbs so low down that there will be practically no trunk to your tree.

Now, how shall we proceed to establish a long-lived, symmetrical, and fruitful tree?

It ought to be understood that any treatment which tends to diminish the amount of foliage developed in summer, to a certain extent cripples and retards the development of woody tissue, which builds up every portion of the tree. The leaves are to a tree what our lungs and blood are to us—its very life. They are the laboratory where the food is manufactured which sustains the life of the tree. Development cannot go on without leaves. A tree deprived of its leaves in summer will surely die. Therefore care must be exercised to encourage the fullest,



[FIG. 1.]

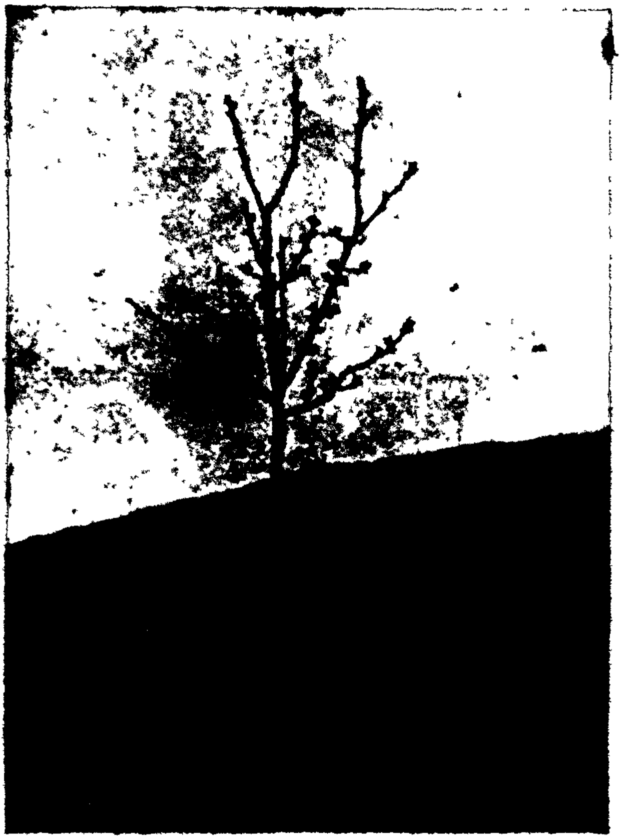
development of foliage. It, therefore, follows that all summer pruning must be discouraged, except to meet certain ends.

In Eastern Washington, where all fruit trees have a tendency to run to fruit very early in life, we have no need for summer pruning. Our aim ought to be to encourage wood growth by severe winter pruning, thereby retarding the fruiting age, and encouraging our trees to develop a strong, healthy frame to enable them to sustain the enormous loads of fruit they will surely have to carry. Allow then, every leaf your tree will make, to remain on the tree during summer.

[FIG 2.]

Pruning time is any time after the leaves have fallen in the fall, and before the buds have developed in the spring. Caution ought to be exercised, however, not to prune during frosty weather. If there be frost in the ground or in the air, the system of the tree may be frozen. To cut the limbs at such times is a detriment, for the cellular tissue being frozen up, cannot come to assist in healing the wound, and the result may be dead stubs.

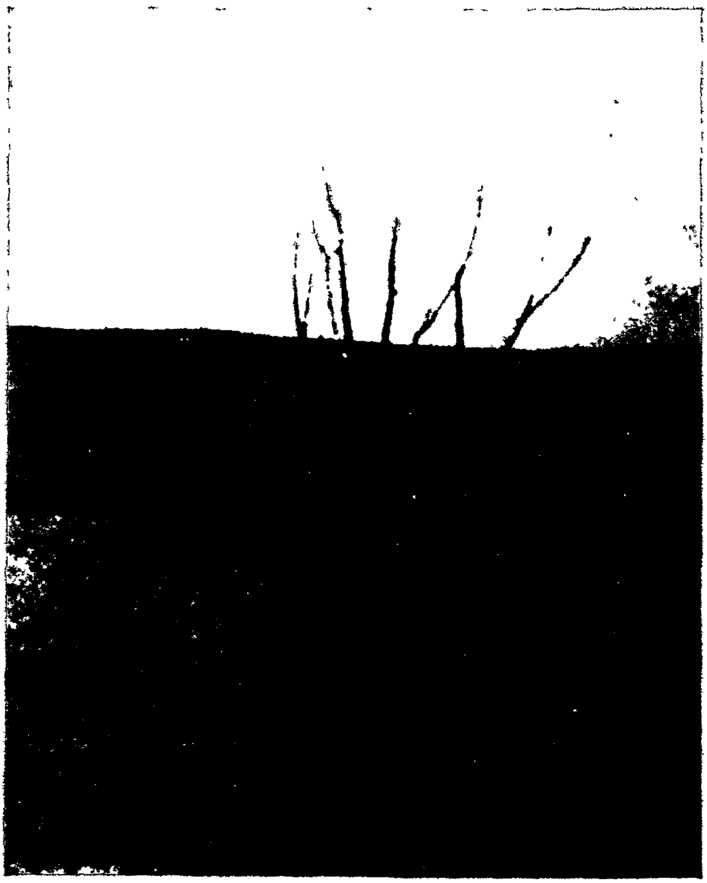
It is now the second season, your switches have developed a nice, bushy top, with a great many more limbs than you need to form the future frame, so you go to work and thin out all the shoots you don't need. In the case of apple, pear, or sweet cherry, three or four main limbs are ample to leave, while plums and other stone fruits may have as many as five limbs left. Select such limbs as will most evenly fill the space all round the tree, and be particular that no two limbs leave the trunk opposite each other, thereby forming a crotch. A crotch is always a weakness in a tree, and is almost sure to split down when the tree arrives at maturity and carries heavy crops of fruit.



[FIG 3.]

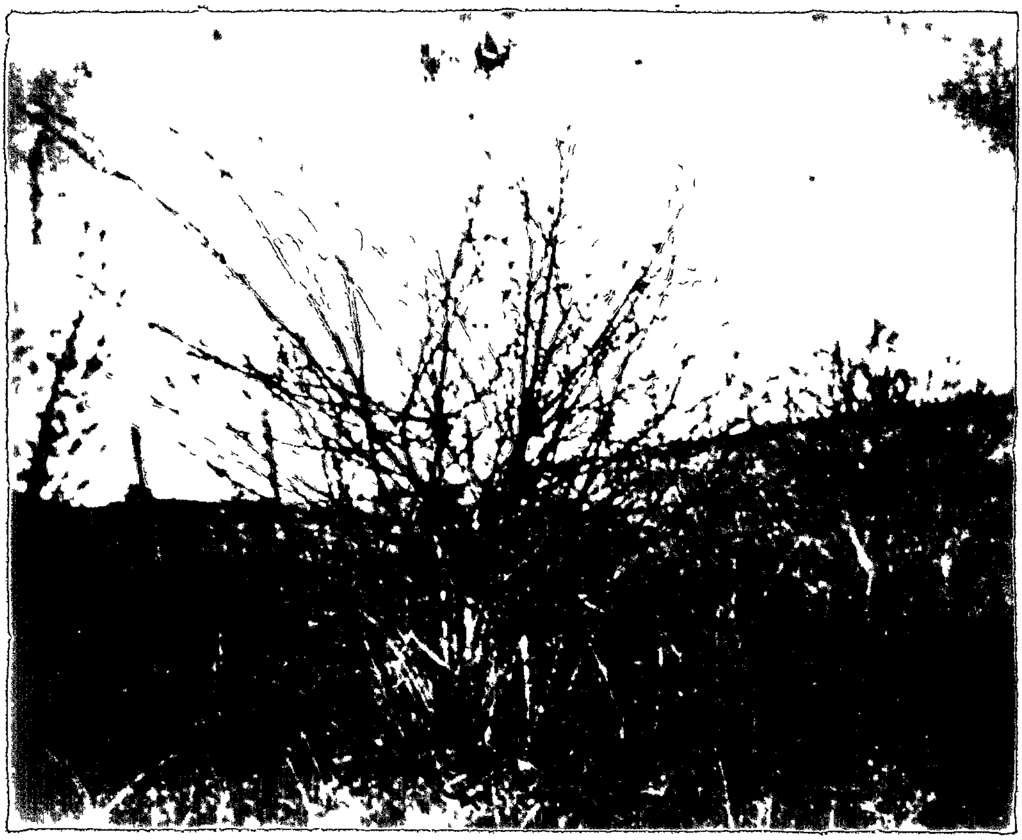
Fig. 1, a two-year-old tree which the nurseryman *trimmed up*, but which we cut severely back, will serve to convey the idea of a tree with a crotch. Having selected the limbs you desire to leave, trim off all the balance, and shorten back the main limbs to within fifteen or eighteen inches of last year's growth. This seems like hard treatment, to sacrifice about four-fifths of the top at the first pruning, but it must be done if you desire a stout, strong, short-jointed tree that will carry, without bending to the ground, all the fruit it will ever bear. You now have a tree something like Fig. 1.

Each of the three or four limbs you leave this year will develop almost every bud on the shoot, and the result will be a perplexing number of young growths to battle with at pruning time next year. Don't be induced, at this stage of the game, to try your hand at summer pruning, or the result may be premature fruiting, the very thing you are trying to avoid. Leave all wood grow, and let every leaf remain on your young trees. And when the leaves have fallen again, take your knife or shears and thin out all limbs except two on each of the main limbs you left last year.



[FIG. 4.]

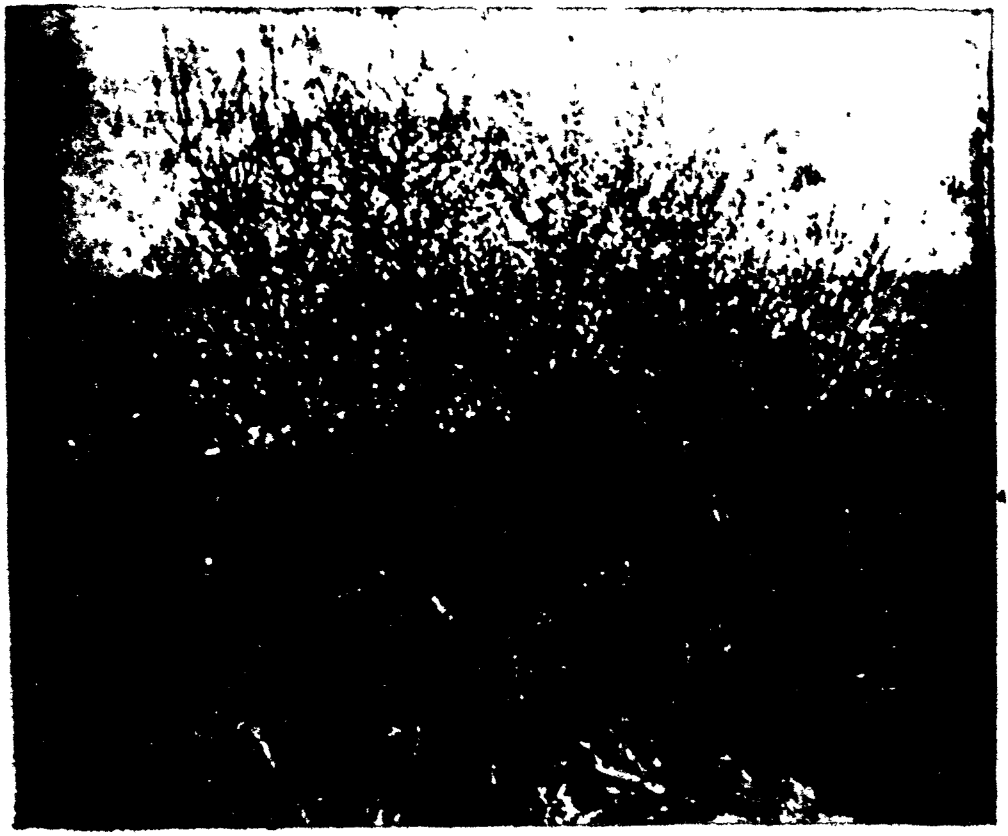
Fig. 2 shows a sweet cherry that has received its second pruning, and illustrates what I mean by leaving two shoots on each of last year's growth. This season, however, I would make spurs of the smaller limbs, *i. e.*, instead of cutting the limbs clean off, I leave a stub an inch or an inch and a half long. This is what we call furnishing the limbs. These little spurs that you leave, in a year or two will have developed fruit buds, and your tree will have formed the very correct habit of bearing its fruit upon every limb down almost to the ground. (See Fig. 2 for illustration of fruit spurs.)



[FIG. 5]

The treatment at pruning time for the next two or three years is similar to that of the second year. Aim to furnish, or feather, your tree as low down the limbs as possible, so that the limbs may not be exposed to the hot sun rays and drying winds.

At the age of four or five years trees will go rapidly into fruit buds, and wood growth will begin to diminish, pruning will become less and less necessary, till finally it will be discontinued; and if you have properly distributed the limbs so that the tree is evenly balanced, not too full of wood and not too thin—for the tendency is to err on the thin side, many trees being mere skeletons—you will have a tree that is a pleasure to behold.



[FIG 6.]

In shaping your tree, the center shoots ought always to be left the longer, and the side limbs shortened in more and more the nearer they are to the ground.

Fig. 3 shows a cherry that has received its third pruning, but which was left too long at the second pruning. Fig. 2 shows a trunk too high. Fig. 4 shows an apple tree headed almost at the ground, and has received its third pruning. Figs. 5 and 6 show a cherry and a plum as they will grow in Eastern Washington when left to their own sweet will.

Old trees require little or no pruning, if their earlier training has been properly attended to, except in cases of water-sprouts, and these may sometimes be employed to advantage in filling in an open top of a tree that is bent out of shape by overbearing. In this case, treat your water-sprout exactly as if it were a young tree. Grow a young tree on top of an old one, and thus maintain the vigor of your trees to a greater age.

Orchardists in Western Washington, where the sun is not so powerful nor the air so dry, and where the trees are later to come into fruiting, may safely adopt, in a measure, the practice of summer pruning, and pinching, to induce fruitfulness, and in severe cases root-pruning may be resorted to to keep the feeders within bounds. But I would caution the amateur to go slow with either practice.

NOTE.—The members of the State Board of Horticulture do not generally concur with Prof. Balmer in his "low-heading" system of pruning. While believing that method as probably being the correct one for sections or climate having high summer temperatures, or where the sun rays are very direct, yet for most localities in the State of Washington they think such low-heading of the trees not desirable.

THE DWARF PEAR.

In growing the pear, either in the private garden or the commercial orchard, the question arises at the outset whether we shall plant what is known as the standard or the dwarf trees. For the last forty years there has been more or less diversity of opinion among the growers of this fruit in the east as to the merits of the two classes. The one seemed to have predominating advantages, and then again the other class was preferred by cultivators.

Here on this coast, in Oregon and Washington, the dwarf trees have been but little planted. It is admitted by all the authorities that unremitting care and good cultivation is indispensable to insure success with the dwarf trees. And to this, no doubt, may be laid the fact that but few of the dwarfs have been planted here with us, as we are given to more superficial ways, the newness of our virgin and large undeveloped resources tending to produce in us easy going methods of work, rather than such intensive cultivation as is now more common in the older sections of our country. Nevertheless, the experience of the past few years has thoroughly taught our practical fruit growers here that the times for obtaining profitable results in the older careless ways of growing our tree fruits are about past. The pear, especially, among these fruits requires the most persevering care here in the line of spraying against fungous diseases, it being exceptionally subject to their blighting influences.

And as the pear upon its own roots as a standard is the largest and tallest growing tree of the different fruits, it follows that any successful method of dwarfing the trees, for convenience in the work of spraying, thinning the fruit, etc., is a desideratum now of increased importance.

In our experience on Puget Sound with this fruit, having some 150 to 200 each of the dwarf and standard trees in cultivation, we find that the dwarfs come into full bearing at least four years before the standard trees; that by judicious pruning they can be kept of a size not to exceed ten to twelve feet in height, and all parts of the tree within easy reach for perfect work in spraying, thinning and gathering the fruit, etc.; that they are better adapted for cultivation upon shallow ridge lands not suited to the growing of the pear on its own roots, as the dwarf is a shallow surface rooted tree; that the Duchesse variety, and which on the whole is the best kind here, we think, is acknowledged by all authorities as so much better when grown upon the quince roots that it should always be grown as a dwarf.

Hence, for these reasons and for others that might be given, our preference is altogether for the dwarf trees for cultivation here on Puget Sound. But in the eastern and drier sections of the state these advantages in favor of the dwarfs would probably not obtain to such a considerable extent, fungous diseases not being so prevalent there, so much care in the way of spraying is not so necessary or essential. SECRETARY.

CHERRIES.

BY PROF. J. A. BALMER, HORTICULTURIST, PULLMAN AGRICULTURAL COLLEGE.

The cherry is a deservedly popular fruit in all parts of the state. It was early demonstrated in the horticultural history of the Pacific slope that conditions prevailing here are pre-eminently adapted to the fullest development of the cherry.

CLASSIFICATION OF THE CHERRIES.

The cherry is a perplexing subject, and the classification of the various types is much confused. We have, however, two tolerably distinct divisions — the one known as the sour cherries, the other as the sweet cherries.

THE SOUR CHERRIES (*Prunus cerasus*) are characterized by a diffuse and mostly low, round-headed, willowy growth, flowers in small clusters from lateral buds, and generally preceding the leaves, the latter hard and stiff, light or grayish-green, and narrowed at the point. The fruit is roundish, and always red or blackish-brown, flesh usually soft and sour, the various varieties covering a season of several weeks.

THE SWEET CHERRIES (*Prunus avium*), distinguished from the sour cherry types by a tall, erect habit of growth, and bark tending to peel off in birch-like rings, flowers flimsy, in dense clusters on lateral spurs, and usually appearing with the leaves, the latter large and more or less limp. The fruit is variously colored, spherical or heart shaped, the flesh sometimes soft, sometimes hard, and generally sweet.

The sour cherry class includes two general types.

1. KENTISH, with pale red fruit, which are generally flattened on the ends, and an uncolored juice. If a cherry be sour, with juice that does not stain the fingers, you may safely class it amongst the Kentish. Early Richmond, Montmorency and others belong to this class.

2. MORELLOS, with very dark red fruit, turning with age to brownish black, spherical to heart shaped, and a dark colored, inky juice. This class of sour cherries is not so easily dis-

tinguishable as are the Kentish, for we seem to have in this class every grade and degree of sourness, and every shade of colored juice, from May Duke to English Morello. Nurserymen class the Dukes and Morellos together, and really I don't see how we can separate them by any distinct distinguishing characteristics, since we find every grade of foliage and fruit common to both types, and a general resemblance throughout.

SWEET CHERRY TYPES.

1. BIGARREAUS.—These are the hard fleshed or crackling cherries, and amongst them are found our very best market varieties. Napoleon Bigarreau (Royal Ann), Windsor, Yellow Spanish, Bing, Centennial, Lewelling (Black Republican) and others belong to this class. Flesh firm and meaty; fruit variously colored from lemon yellow splashed with red, as in Napoleon, to dark brown or blackish, as in Lewelling.

2. HEARTS.—So called because of their resemblance to this organ. This class includes Governor Wood, Elton, Coe's Transparent and a goodly list of others, many of them valuable for shipping to nearby markets and also for canning. Fruit variously colored, from the typical red and lemon of the Bigarreaus to white, purple, or even black; flesh usually soft, sweet to subacid, and with a habit of tree favoring true sweet cherry types.

Only those who have made a study of our cultivated cherries can realize what an impossible task it would be to classify the varieties correctly, but the above general types can be borne in mind.

On page 84 of the second biennial report, 1893-94, you will find some remarks on the cultivation of cherries, and to which the following remarks are supplemental. The list of varieties recommended for planting in the state in the report referred to embraces the following: Napoleon Bigarreau (Royal Ann), Lewelling (Black Republican), Black Tartarian, Governor Wood, Elton, Major Francis and Bing, with an additional note on page 76, recommending Centennial.

We will all agree that the list contains most of our valuable shipping varieties, but is made up entirely of sweet kinds, to the neglect of the sour kinds, amongst which are some of our most valuable market cherries, and it is of these I wish to speak.

The sweet cherries are a great success in most localities west of the Cascade range, and also in some of the irrigated regions in the eastern part of the state, but there is a large territory in Eastern Washington, viz., on the high table lands, where irrigation is impracticable, and where the sweet cherries are not an unqualified success, but where the sour varieties luxuriate and produce enormously. In our cultivated cherries the sour varieties outnumber the sweet ones almost two to one, and in a state so pre-eminently adapted to the production of fine cherries, it seems a pity our best sour varieties have not found more favor with planters.

True, we find in almost every door yard a tree or two of "pie" cherries, usually the Early Richmond (Kentish) variety, but it seems to me, if the qualities of such kinds as Wragg, Montmorency, English Morello and Ostheimer (Ostheimer Weichsel) were better known, we would find them more largely planted.

There fruited at the experiment station at Pullman the past season about thirty varieties of cherry, amongst them the sour kinds above mentioned, including Early Richmond, the whole presenting an excellent object lesson on the cherry.

To my mind the best and most profitable of all the sour cherries is the comparitively unknown variety known under the name of *Ostheimer Weichsel*, abbreviated Ostheimer. This variety must not be confused with the other sour variety—of nearly the same name—Ostheim, a much inferior sort.

This magnificent late cherry comes to us from Germany, having been introduced into that country from Spain in the year 1814, and brought from there to Kansas City, where it was beginning to attract much attention about the time the Ostheim, a much inferior sort, was heralded abroad, when without any apparent cause, except the similarity in name, they were tacitly assumed to be identical—greatly to the loss of cherry culture generally. Mr. G. F. Esp^nlaub, of Kansas, says: "The best, most valuable and profitable sort I have; good grower, bears early, is very productive, fruit large, dark liver colored when fully ripe, juicy, rich, almost sweet." Every word of which I fully indorse except the last two. It is not almost sweet, but almost sour, but not so tart as the English Morello, Early Richmond or Montmorency. If I were to try and classify this variety, I would place it midway between a May Duke and an English Morello, much resembling the latter in size and shape of fruit, but with larger foliage and sweeter fruit, and also lighter colored juice.

Another cherry in the same class is Wragg, a large dark colored, sub-acid cherry ripening a week or ten days earlier than the Ostheimer; has a healthy fine habit of tree, bears early and abundantly, and it, with English Morello and the variety above described, form a trio of sour cherries that will be hard to beat.

PLANTING AND CULTIVATING.

Cherries are almost invariably planted too close together. All sweet cherries ought to be planted not less than thirty feet apart, and thirty-five feet would be better, whilst those of the Duke class ought to be closer than twenty-five feet; and only a few of the sour kinds can be planted as close as twenty feet apart without serious detriment to the trees.

The cherry loves a moist, though not a wet, soil, and as the crop is an early one, the trees had better be pruned in the fall, or very early in the spring, in order to facilitate early plowing and stirring the soil in the spring.

Locations somewhat elevated, out of the fogs and frosts, will give surer and more regular crops than will plantations in low valleys.

Clean culture ought to be resorted to at all times, if the finest, fullest development of fruit and tree is desired.

Fertilizers are hardly necessary for the cherry. The fruit being largely water, does not impoverish the soil very rapidly.

Trees will not live long in the eastern part of the state, but as they are so easily grown, and, moreover, give the finest fruit in the first ten or fifteen years, it will hardly pay to gather fruit from very large trees, and on this account a new plantation had better be made periodically.

An important item to be considered before planting cherries is the matter of help. To pick and pack a crop of chierries is no small job, and unless you have plenty boys and girls in your neighborhood you had better not plant out too many cherries.

FRUIT PRESERVING AND CANNING ESTABLISHMENTS.

The putting up of fruit in the form of jams and jellies, and the canning of the same in a commercial way, has long been looked upon as a sort of bugbear by the fruit grower. Here in this state, where markets are to some extent not fully established or developed, and where it often occurs that there is a surplus during the season of the perishable small fruits especially, not always readily saleable at remunerative prices, and where the conditions are such that were a certain market available and ensured, the growing of such fruit would offer very tempting inducements to many of the smaller holders of lands, the establishment of canneries has been looked upon as a desideratum much to be desired.

Strange it has been that, like the countryman in the fable who was continually calling upon the God of Fortune to come to his assistance and extricate him from his difficulty while he ever failed to put his own shoulder to the wheel, our growers seem never to understand that, as regards the putting up of fruit in the jam and jelly form, the work could be done at home to greater advantage, and be ensured of a better grade or quality of goods, than such work could in any case be done in large factory establishments. The ordinary skill of the housewife would seem to be all that is required, and all packages and material required can be purchased in limited quantities, and at no material advance over large purchases. The ordinary tin top jelly glasses are without doubt the best form of package for this class of product, and these can be obtained anywhere; and if the fruit is put up while fresh on the farm its quality must be superior.

But when it comes to putting up such fruit into tins in the way of canning, in the ordinary commercial form, the procedure is often thought to be complex and wrapped up in a great deal of mystery, and it is generally believed that a large capital and plant is required. Such, however, it may be said, is quite erroneous, and, in fact, probably the cause and reason of the failure of so many of these establishments lies in the embarking of too much capital in them — the same lying idle through a large portion of the season. And there seems to be no good ground existing today, if there ever was, for any but the cheapest form of plant in the way of all that is required for fitting up a cannery on a limited scale, and that will give as good satisfaction, both in the quality of the product turned out and in the economy of working. Moreover, the tins or cans themselves can be purchased in 1,000 lots, at no very material advance over the prices of 10,000 or 100,000 lots, and the same as regards labels used.

The actual work itself requires no more skill than any ordinary person is often called to do in the ordinary walks of life. A good, practical knowledge of the canning of fruit in tin would seem to be but a question of skill that could be picked up in a few days' actual work of the kind; this, of course, after being in the possession of the general principles common to such work. The whole operation may be said to be no more complicated or difficult of attainment than that of putting up the same fruits in glass, as practiced by the ordinary housewife.

The State Board of Horticulture, having for some time been practically of the above opinion, has of late secured the services of an expert and practical canner in this line, and who has given them the different formulas for the various fruits and vegetables, and practical instruction in the work of canning itself, with the use of the various tools and arrangements required in the work. All this information the board proposes at no distant date to place before the public in such a shape as will be of the greatest value to the fruit growers specially, with plans, etc., and all information, arranged for such canning on a limited scale.

THE SCIENCE OF PROPAGATING FRUITS—SOME OF NATURE'S LAWS TO OBSERVE.

CHATFIELD KNIGHT, COMMISSIONER FIRST DISTRICT.

In expressing an opinion on a subject so vital to fruit growing as the one before me, it is perhaps necessary to mention some points in regard to the origin and development of the cultivated species and varieties of fruit as now found in their present standard of excellence. The history of such facts as can be obtained is somewhat obscure, but it is generally conceded that all such fruit came from a crude, wild and undeveloped condition, and that it has been brought to its present degree of perfection by the intelligence of man. This has been done by a systematic process of cross breeding, polenizing, mixing back and forth, changing climate, etc., and all through a long continued process of the selection of the types desired.

Now if this be true, the natural tendency of all such fruit is to go back to a primitive state, if the methods by which it was brought to its present degree of perfection are neglected. This applies to live stock as well as to the vegetable kingdom, and all things in nature where artificial methods have been applied to bring about a greater degree of perfection. Successful vegetable gardeners look carefully after choice seeds for planting, in order to retain any variety at the highest degree of perfection. The same principle applies to the cereals, and certainly fruit is not an exception.

AS APPLIED TO APPLES AND PEARS.

It has been said that there are numerous new varieties to take the place of such varieties as may be considered unprofitable to propagate. In a sense this may be true, but it will be many years before we will be able to fill the vacancy by displacing such varieties as the Gravenstein, Northern Spy, Baldwin, Spitzenburg, Newtown Pippin and many others that might be mentioned that are in many instances shy bearers, or the trees not healthful. Again, after we have been to the expense of purchasing trees, caring for them from six to ten years without profit, and then find them deteriorated stock, a remedy cannot be found to meet the emergency. The owner under these circumstances will naturally be discouraged and neglect his orchard. Such as may be shy bearers can profitably be top-grafted into suitable varieties, but there is no remedy for a weak, sickly tree but replacing with new stock.

THE SEED WE PLANT, AND HOW IT MAY AFFECT OUR TREES.

If we expect a hardy, vigorous root to our trees, we must plant the choicest seed, well developed, and this ensures a good stock. The seed should be selected from perfect fruit, and a healthy tree. This I believe to be the fundamental principle of successful orcharding. After the stocks are grown, the best of them should be selected for budding or grafting. Last spring I saw some stocks grown from apple seed, carefully selected, and which had the usual care or cultivation, and there was a marked difference between these and the majority of those seen in nurseries.

BUDS OR SCIONS TO BE USED.

This is as important in order to procure a healthy top and vigorous bearer as the former in producing a suitable root. Scions or buds should be selected from a perfectly healthy, well shaped tree, and one that is a good bearer, and also one that bears choice fruit and old enough to be established in these features. Shy bearers should always be avoided. It is a mistake to select from young trees before healthiness and fruiting is well established. This has been practiced quite extensively to my knowledge.

These principles were observed and understood by the older students of horticulture many generations ago, but at the present time are not sufficiently observed. At the present time seeds used for growing stocks are generally purchased from the commercial dealers, and originally nine-tenths of these seeds came from the cider mill, and the largest proportion of the manufactured cider is made from culls, or third grade fruit that was unfit for market. Such apples could not produce choice seed.

It may be truly said that to some extent these defects may be overcome by extra care of the trees in the way of cultivation, etc., but to my mind this will be quite limited. The same will apply to trees that are sterile or weak in fruit energies. How often we can see in an orchard certain trees that are extra bearers, producing a larger amount and a superior quality of fruit alongside of the same varieties that do not do so. This can be observed in almost every orchard, my own not excepted. We are living in an animated age, and persons desirous of growing an orchard are generally in a hurry, usually purchasing the cheapest trees (which prove to be the more expensive), with the idea that "a tree is a tree." For a number of years past our nurserymen could hardly fill their orders, and were necessarily driven to extremes to supply the demand.

I would prefer one hundred trees propagated with a strict observance of the law of the selection of the finest and best, than one thousand improperly selected. The State of Washington is naturally adapted to fruit culture, and it is my desire to help produce healthy trees and perfect fruit, and which certainly can be obtained by the proper study and observance of nature's laws and from a long continued and judicious selection of the best for the purpose of reproduction, and not otherwise.

TREATMENT FOR APPLE TREE DISEASE, COMMONLY KNOWN AS BLACK SPOT.

CHATFIELD KNIGHT, COMMISSIONER STATE BOARD OF HORTICULTURE.

For some years past quite a number of apple trees in my orchard have been affected with the black spot or canker. This disease spreads very rapidly, and in many instances totally destroys the tree, and as far as my knowledge goes no disease seems to be so prevalent or fatal. For the benefit of those who have trees affected I will give the results of my experiments made the past season. The trees treated were six to nine years old. The treatment used on them was the incision or splitting of the bark, as recommended by J. F. Cass, secretary of the state board of horticulture, as follows:

With a sharp knife split the bark through the diseased spots into healthy bark above and below the spots, cutting to the wood. Make these slits from one-fourth to one-half inch apart, being careful in making them not to allow one to intersect another. This done the sap rushes into the spots and new bark is formed under the old. This work should be done during the growing season.

I treated at least twenty-five trees in this manner last summer, one-half of them the first of June as an experiment, and the result in two weeks time was so promising that I gave the others the same treatment. I examined them carefully in October, and am safe in saying that ninety per cent. of the spots were entirely healed over, many of them being as large as the palm of my hand. Where work was carefully done as above described the spots healed over much quicker.

The above is a good remedy, but I expect to see the time when a prevention for many of these diseases will be discovered, such as by the application of the proper mineral elements to the soil at the proper season, as needed for the most healthy tree growth. But until such general preventative or remedy is discovered we must use the best means at our command to avoid the disease effects.

METHODS OF CONTROLLING INJURIOUS INSECTS.

REMEDIES FOR IMPORTANT INSECTS.

APPLE LEAF SKELETONIZER (*Canarsia Hammondi* Riley). Spraying with arsenicals (Paris green and London purple) in June; hand picking of leaves with larvæ.

APPLE ROOT LOUSE, WOOLLY APHIS (*Schizoneura lanigera* Hausm). Kerosene emulsion under and above ground; scalding water poured freely about the roots; bisulphide of carbon under ground about roots; ashes around trunk; salt, sulphur and lime solution spray as soon as leaves fall in autumn.

APPLE TREE APHIS, GREEN APHIS (*Aphis mali* Fahr.) Spraying with the kerosene emulsion; quassia chips and whale oil soap solution; in dormant season the salt, sulphur and lime, or strong alkaline solution sprays; cutting off and destroying the ends of the twigs carrying most of the eggs in winter.

APPLE TREE BORER, FLAT HEADED (*Chrysobothris femorata* Fab.) Painting trunk and larger branches in June with strong soap solution, washing soda or mixture of whitewash and Paris green, or solution of three gallons of water to one can of concentrated lye.

ASPARAGUS BEETLE (*Crioceris asperagi* Linn.) Prompt marketing of all canes; dusting with lime; arsenical mixtures (Paris green and London purple); jarring larvæ to ground on hot days, especially if ground be sandy.

BLISTER BEETLES (*Epicauta vittata* Fab.) Arsenicals, one pound to 100 gallons of water.

CABBAGE WORMS (*Pieris rapae* Sch.) Pyrethrum; kerosene emulsion; Paris green, dry, with flour or lime, one part of the poison in 50 to 100 of the dilutant.

CANKER WORM, SPRING (*Paleacrita vernata* Peck.) Arsenical mixtures in spray; trapping female moth in oil troughs or tar bands about trunk of trees.

CODLIN MOTH; APPLE WORM (*Carpocapsa pomenella* Linn.) Arsenicals: first application as soon as blossoms fall, second one or two weeks later, just before the fruit turns down on the stem; trapping larvæ by applying bands to the tree; prompt destruction of infested fruit.

FOREST AND APPLE TREE TENT CATERPILLAR (*Clisiocampa sylvatica* and *Americana* Harris). Cutting off egg deposits from the trees during winter and destroying same; paper or cloth bands smeared with axle grease tacked to trunks of trees to prevent ascension of the caterpillar; arsenical sprays.

CURRANT WORM (*Nematus ribesii*) Hellebore, one ounce to two gallons of water, in spray.

CUCUMBER BEETLE, STRIPED (*Diabrotica vittata* Fab.) Protecting young plants with netting; arsenicals.

CUTWORMS (*Agrotis*, *Leucania*, etc.) Distribution of poisoned green bait; late fall plowing; burning waste tracts and rubbish.

FRUIT BARK BEETLE (*Scolytus rugulosus* Ratz.) Burning trap trees and infested trees at any time, but preferably in winter.

GRAPE PHYLLOXERA (*Phylloxera vastratrix* Planch.) Submersion; bisulphide of carbon, kerosene emulsion or resin compound about roots; use of resistant stocks.

GRAPEVINE LEAF HOPPER (*Erythroneura vites* Harr.) Spraying with kerosene emulsion in early morning; catching on tarred shields; cleaning up all leaves and rubbish in the fall.

HOP PLANT LOUSE (*Phorodon humuli* Schr.) Destroying all wild plum trees in the vicinity and spraying others in fall and spring with strong kerosene emulsion; spraying vines with kerosene emulsion or with the quassia chips and whale oil soap solution; destroying vines after hops are picked.

LOCUSTS, CALIFORNIA DEVASTATING (*Melanoplus devastator* Scudd.) Poisoned bait of bran, sugar and arsenic.

MAPLE, WOOLY, BARK LOUSE (*Pulvinaria innumerabilis*). Infesting currant and gooseberry bushes, and the quince, hawthorn and other shrubs; strong soap or alkaline washes in dormant season; salt, sulphur and lime solution in same season.

OYSTER SHELL BARK LOUSE (*Mytilaspis pomorum* Bouche.) Strong soap or alkaline washes, or the salt, sulpher and lime solution spray in dormant season.

PEACH TREE BORER (*Sanina exitiosa* Say.) Cutting out the larvæ or scalding them with hot water in late autumn or early spring; painting trunk with arsenicals in thick whitewash; wrapping trunk with grass, paper, etc.

PEAR TREE PSYLLA (*Psylla pyricola* Forst.) Kerosene emulsion; first, a winter application diluted seven times; second, in spring as soon as leaves are unfolded, diluted nine times.

PEAR TREE SLUG (*Eriocampa cerasi* Peck.) Hellebore, one ounce to two gallons of water in a spray; whale oil soap, twelve pounds to fifty gallons of water; arsenicals.

PEA WEEVIL (*Bruchus pisorum* Linn.) Keeping seed over to second year; bisulphide of carbon in tight vessels.

PLUM CURCULIO (*Conotrachelus nenuphar* Herbst.) Arsenical spray; first, before the bloom appears or as soon as foliage starts; second, immediately after blossoms fall; third, a week or ten days after the last; collection of adults from the trees by jarring.

ROSE CHAFER (*Macrodactylus subspinosus* Fab.) Planting spiraes as trap plants; arsenicals; kerosene emulsion.

SAN JOSE SCALE (*Aspidiotus perniciosis* Comst.) Soap wash, two pounds to the gallon, as soon as leaves fall in the autumn; in warm, dry climate, winter resin wash; salt, sulpher and lime solution spray in dormant season.

SQUASH BORER (*Melittia ceto* Westw.) Planting early summer varieties to be destroyed; late planting of main crop; destruction of all vines attacked as soon as crop can be gathered; collecting moths.

WEBWORM, FALL (*Hyphantria cunea* Dr.) Prompt removal and destruction of webs with larvæ; arsenical spraying.

WHITE GRUB, JUNE BEETLE (*Lachnosterna* Spp.) Luring the beetles by lights over tubs into water with skim of kerosene; against larvæ with kerosene emulsion.

TREATMENT FOR FUNGUS DISEASES OF TREES AND PLANTS.

In the following table the trees and plants affected are arranged alphabetically, and in columns opposite each name are given the number of times and methods of making the various treatments.

DISEASE.	FIRST APPLICATION.	SECOND APPLICATION.	THIRD APPLICATION.	FOURTH APPLICATION.	FIFTH APPLICATION.	REMARKS.
Almond or apricot shothole fungus.	Ammoniacal copper carbonate solution when leaves unfold.	Same fungicide ten or twelve days later.	S'me fungicide fourteen days later if necessary.	Same fungicide fourteen days later.	....	
Apple scab.	Bordeaux mixture when fruit buds are unfolding.	S'me fungicide wh'n flower clusters are expanding.	S'me fungicide wh'n petals are falling.	Same when fruit is one-half inch in diameter.	Same two w'ks later.	Paris green may be combined with fungicide, one pound to 200 gallons, for Codlin moth.
Cherry leaf blig't.	Bordeaux mixture after foliage is fully developed.	S'me fungicide fourteen days later.	S'me fungicide fourteen days later.	Same fourteen days later.	Same fourteen days later.	This remedy for all vars. of leaf fungi and blights.
Cherry and plum black knot.	Bordeaux mixture before leaves appear.	Same fungicide two weeks later.	....	....	....	The knots should be cut off and burned.
Grape black rot.	Bordeaux mixture before buds open.	S'me fungicide wh'n leaves are one-third grown.	Same fungicide just before blooming.	Same two weeks later.	Am. car. cop. solut'n two w'ks later.	A sixth application may be necessary; should be made with carbonate copper solution.
Grape downy mildew.	Bordeaux mixture when leaf buds open.	S'me fungicide wh'n leaves are half grown.	S'me fungicide wh'n plants are in bloom.	Same when fruit is one-half grown.	....	Same treatment for this and foregoing will generally answer.
Peach curl.	Bordeaux mixture just before buds unfold.	S'me fungicide wh'n leaves are half grown.	Same fungicide two weeks later.	Same two weeks later.	....	This treatment found especially beneficial on Puget S'nd.
Pear leaf blight.	Bordeaux mixture when buds are swelling.	S'me fungicide wh'n leaves are half grown.	Same fungicide two weeks later.	Same two weeks later.	Same two w'ks later.	For nursery especially.

TREATMENT FOR FUNGUS DISEASES OF TREES AND PLANTS—CONCLUDED.

DISEASE.	FIRST APPLICATION.	SECOND APPLICATION.	THIRD APPLICATION.	FOURTH APPLICATION.	FIFTH APPLICATION.	REMARKS.
Pear scab.	Bordeaux mixture when fruit buds open.	Same fungicide just before blossomi'g.	S'me fungicide wh'n petals fall.	Same when fruit is one-half inch in diameter.	....	
Plum, prune and peach leaf rust.	Ammoniacal copper carbonate solution when trees cease to bloom.	S'me fungicide three weeks later.	Same fungicide two weeks later.	....	....	
Potato rot or blight.	Bordeaux mixture when plants are 6 inches high.	Same fungicide two weeks later.	Same fungicide two weeks later.	Same two weeks later.	....	
Potato scab.	Cut and soak seed in corrosive sublimate solution one and a half hours.	....	....	....	....	
Quince fruit spot and leaf blight.	Bordeaux mixture after blossoms fall.	Same fungicide two weeks later.	Same fungicide two weeks later.	Same two weeks later.	Same two w'ks later.	Sixth applicat'n may be necessary in wet weather.

COST OF SPRAY MATERIALS.

Eagle lye, case of 4 dozen, $3.50; per dozen, 90 cents.

American lye (Lewis), case of 4 dozen, $3.75; per dozen, 90 cents.

Lime, 10 barrel lots, 90 cents; less quantity, $1 per barrel.

Ground sulphur, 3½ cents per pound; 100 pound lots, 3 cents; barrels containing 425 to 430 pounds, 2½ cents.

Whale oil soap in barrels of 325 to 375 pounds, 5½ cents per pound; in boxes of 100 pounds, 5¾ cents per pound; less quantity, 8 cents.

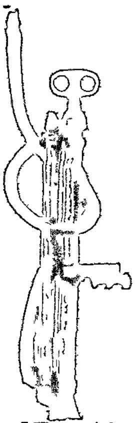
Blue stone (sulphate of copper), barrels, about 330 pounds, 5 cents per pound; in 100 pound lots, 5¼ cents; per pound, 6 cents.

Quassia chips in 100 pound lots, 5¼ cents; per pound, 6 cents.

Some drug companies are inclined to charge exorbitant prices for the above, hence we are glad to publish these quotations.

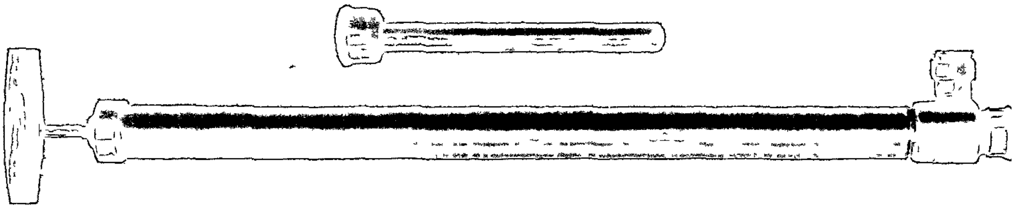
SPRAY PUMPS.

Spraying now being a necessary part of the work of the fruit grower, much ingenuity has been applied to the invention and construction of spraying pumps. These meet with large sale in all the fruit growing states. We here add illustrations of some of the standard and best known of these much used in the state, and commonly found on sale by dealers in agricultural implements, etc.



[FIG. 1.]

Fig. 1 — Shows the Myers' Double Cylinder Hand and Bucket Pump, that can be recommended as a cheap and serviceable one when but little spraying is to be done.

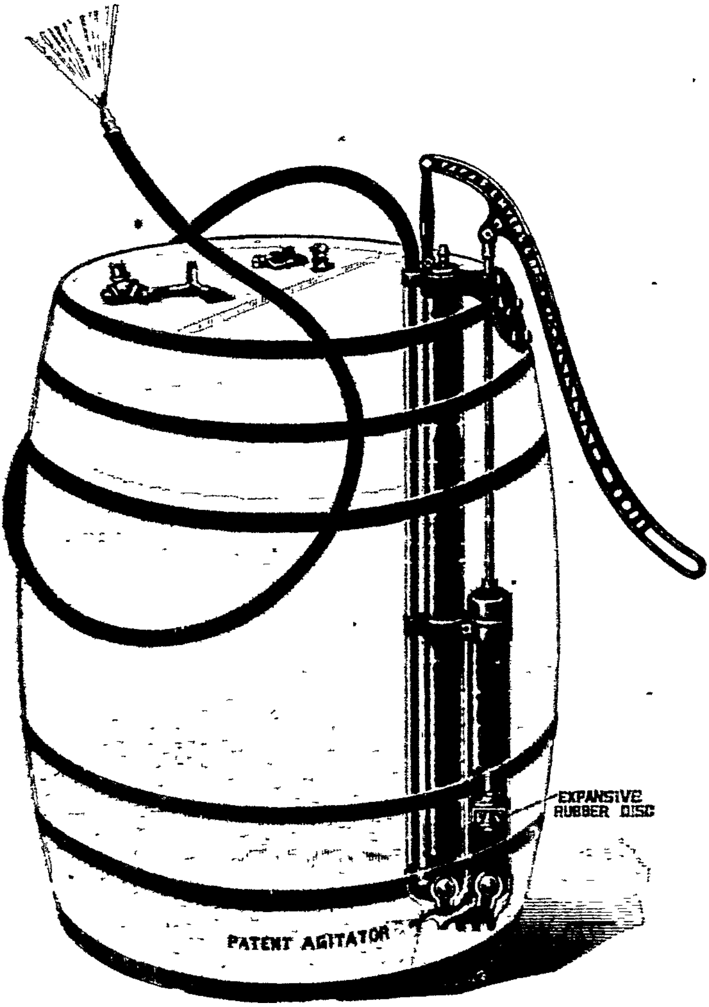


[FIG. 2.]

Fig. 2 — Is the Ollard Bros. Hand Syringe and Sprayer. It is almost indispensable in the garden and greenhouse, and to those

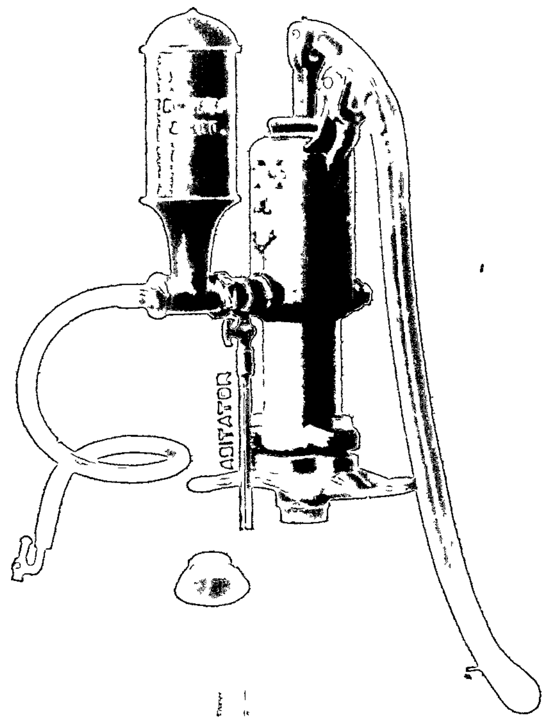
that have shrubbery and young trees to care for. This is made in Tacoma by Ollard Bros., and who also manufacture other large power sprayers.

Fig. 3 — Is a new eastern invention that makes the knapsack form of spray pump an established success. The knapsack sprayer is considered by many as being the best form for practical use for the ordinary average fruit grower and farmer not needing a large or power sprayer. Heretofore none of the knapsack style of sprayer has been produced that would throw the spray with sufficient force to be effective. It is manufactured by the DeClercq Bros., of Cazenovia, N. Y. [Illustration not furnished.]

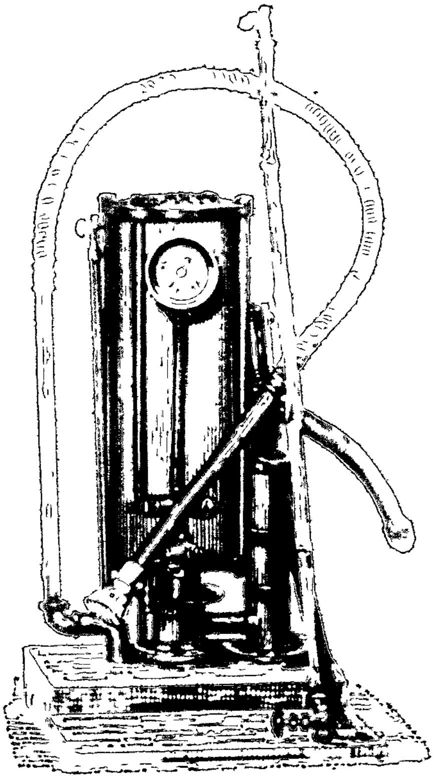


[FIG. 4.]

Figs. 4 and 5 — Two varieties of Barrel Spray Pumps are shown.

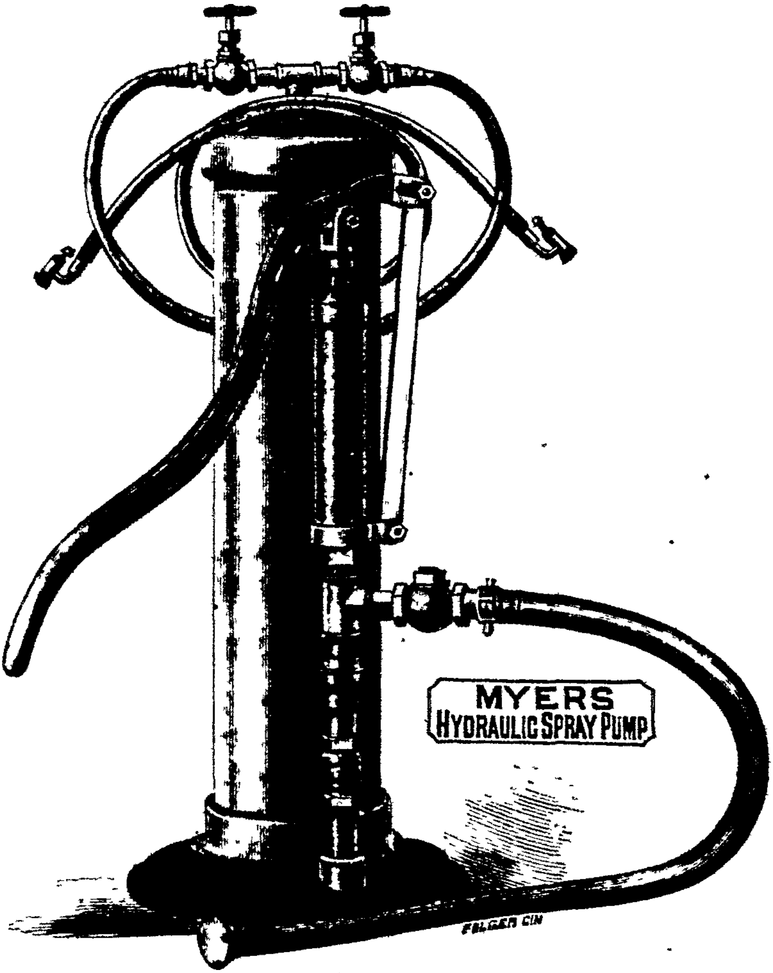


[FIG. 5.]



[FIG. 6.]

Fig. 6—Shows the Bean Sprayer so much and commonly used on this coast. This, and the Myers, have the large air chambers that are essential for the perfect and effective work desired in a first-class pump.



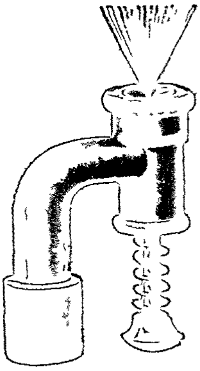
[FIG. 7.]

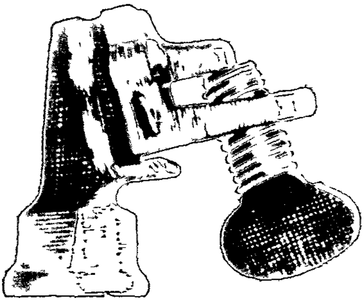
Fig. 7—Represents the large size of the Myers, or Hydraulic Spray Pump.

NOZZLES.

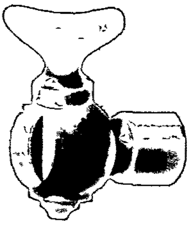
The Vermorel nozzle is the standard for throwing summer solutions. While the new Bean is thought to be the most efficient to use with the salt, sulphur, and lime solution spray.

The Bordeaux nozzle is also used with this solution, throwing a coarse spray with considerable force. The nozzle on the Ollard pump gives out a very fine, misty spray. Also one form of nozzle used on the DeClercq pump. It has also another form throwing a coarse spray a considerable distance. The Bean cyclone spray nozzle is highly recommended for general use, and is easily and quickly degorged if clogged, which with some sprays is an essential point. All the above are the most approved forms now in common use.


Vermorel Nozzle


New Bean Nozzle

Bean Cyclone.


Bordeaux Nozzle.

The orchardist should be provided with at least the two forms of nozzles — throwing both the fine and coarse sprays — to do the most effective work.

INSECTICIDES AND FUNGICIDES.

Arsenicals, Paris green and London purple; these two arsenicals practically take the place of all other insecticides for the biting and knawing insects living or feeding on the exterior of the foliage of trees and plants. London purple is not as effective as Paris green, and is apt to scald the foliage unless mixed with lime.

Both these arsenicals may be used as follows:

PARIS GREEN.

Paris green, 1 pound; water, 160 to 200 gallons; lime, 2 to 4 pounds. First make a paste of the Paris green and lime, which should be freshly slaked, then add the water. For codlin moth and any insects which chew, as caterpillars, worms, slugs, etc.

Paris green and Bordeaux mixture can be applied together with perfect safety. The action of neither is weakened, and the Paris green loses all caustic properties.

LONDON PURPLE.

This is used in the same proportion as Paris green, but as it is more caustic, it should always be applied with the lime or with the Bordeaux mixture. Do not use it on peach or plum trees, but use the Paris green mixture.

For insects which chew. Same as Paris green.

KEROSENE EMULSION—COOK FORMULA.

Mix 1 quart soft soap or one-fourth pound hard soap with 2 quarts boiling water. As soon as the soap is dissolved stir in, while yet hot, 1 pint kerosene oil; stir this violently until permanently mixed, so that when standing the oil will not rise to the surface, but remain incorporated with the liquid. When ready for use add enough water to make 15 pints, or use in such proportion that the solution contains 15 times as much water as oil.

This is easily made, and can be used for leaf lice on all plants which are not too tender. Use, also, for oyster shell bark lice when newly hatched out early in June.

QUASSIA CHIPS AND WHALE OIL SOAP.

Quassia chips, 8 pounds; whale oil soap, 7 pounds. Soak the chips 12 hours in 8 gallons of water. Dissolve the soap by boiling in sufficient water to cover it; strain the extracts from the quassia and add the two ingredients together. Stir thoroughly and dilute to make 100 gallons. Use with sprayer.

RESIN WASH (PROF. KOBELE).

Resin, 4 pounds; salsoda, 3 pounds. Place the resin and salsoda in a kettle with 3 pints of cold water. Soft or rain water should always be used. Boil or simmer slowly until thoroughly dissolved, when it will look black. Scrape down any salsoda which adheres to the sides of kettle. Continue boiling until there are no pieces of resin to be found in the bottom of the kettle. When sufficiently boiled add enough hot water to make 50 gallons; boil again a few minutes and it is ready for use. Apply cold, or only lukewarm.

This solution is recommended as a summer wash to check the San Jose scale, or any of the bark lice. It has also been recommended for green aphis, but tests should be made before applying extensively, to ascertain the strength which the foliage may bear.

HELLEBORE.

Fresh white hellebore, 1 ounce; water, 3 gallons. Apply, when thoroughly mixed, for insects which chew.

LIME, SULPHUR AND SALT.

FORMULA FOR THE DORMANT SEASON.

Unslacked lime	40 pounds.
Sulphur. (flour of sulphur)	20 pounds.
Salt	15 pounds.
Concentrated lye (American Lye Co. brand)	2 pounds.

Water to make 60 gallons.

If from ten to twenty pounds additional lime is added the solution will have a whiter appearance, and it is more easily detected when each branch is sprayed sufficiently. Where San Jose scale thickly infest the trees it may be advisable to use only from forty-five or fifty gallons of water to the above solution. It is more effective when applied while hot.

DIRECTIONS.—Place ten pounds of lime and twenty pounds of sulphur and the lye in a boiler with twenty gallons of water; stir and boil over a brisk fire for not less than two hours, or until the sulphur is thoroughly dissolved. When this takes place the mixture will be of an amber color. Next, place in a cask thirty pounds of unslacked lime, pouring over enough hot water to thoroughly slack it (being careful to keep it moist and not to spoil it by burning). When the lime is thoroughly dissolved add it and the salt to the lime and sulphur in the boiler and boil for half an hour longer, when the necessary amount of water to make sixty gallons should be added. When using, it should be frequently and well stirred.

BORDEAUX MIXTURE.

Copper sulphate, 6 pounds; quick lime, or freshly slacked lime, 5 pounds; water, 50 gallons. Dissolve the copper sulphate by putting it in a bag of coarse cloth and hanging this in a vessel holding at least 4 gallons, so that it is just covered by the water. Use an earthen or wooden vessel; slack the lime in an equal amount of water. Then mix the two and add enough water to make 50 gallons. It is then ready for immediate use. For rots, moulds, mildew, apple scab, pear scab, and all fungus diseases.

A modified form of Bordeaux mixture is made by taking 4 pounds lime, 4 pounds copper sulphate and 50 gallons water. This diluted mixture has been found effective in many cases, and is recommended to be used when spraying immediately after the fruit has set.

AMMONIACAL COPPER CARBONATE.

Copper carbonate, 5 ounces; ammonia (concentrate), 3 pints;

water, 45 gallons. Dissolve the copper carbonate with the ammonia; then add the water. For plum leaf rust.

THE PRECIOUS APPLE.

SUGGESTIONS FOR GROWING A WHOLESOME AND NUTRITIOUS FOOD.

The apple orchards generally found here on Puget sound are often quite uncertain in the way of giving any reasonable expected return for the investment of labor and other expense involved in their establishment and care.

Going into any such average orchard in general in Western Washington one will find that fully one-half of the trees are of varieties that are not worth the ground room, and never have and never will be with the ordinary care and attention such orchard commonly receives. One-half of the balance of the trees will, perhaps, not give sufficient return to pay the expense of their care and cultivation, leaving all the profit of the whole orchard to be returned by the remaining one-fourth of the trees. Making a still further subdivision, it would be found that there are a few trees that are always to be depended upon to return crops of good and choice fruit readily salable at fair prices, while another proportion are of somewhat doubtful character in this respect.

Of course, this could not be said of an orchard, of even miscellaneously selected varieties, cultivated and cared for by an expert, but only with the average care received in general. But it would be safe to say that an expert would not be long in changing his trees by regrafting to varieties the most profitable, if these were not right at first.

And there is no question at all but that in the proper selection of varieties lies the principal secret of the successful and profitable cultivation of this fruit here with us. And experience has taught us here at length these facts:

That in our climate in Western Washington, and in the hazy, smoky and foggy atmosphere common to our autumn season here, and at an altitude not much removed above sea level, we cannot produce a highly colored red late ripening apple. The prevalent cool weather of that season is also not conducive to the coloring of the red varieties. Yet for the finest development of the best yellow and russet varieties no district or country seems to surpass the Puget Sound region.

It is now also getting to be well understood that experience is the only sure guide here for the selection of varieties that will give the most satisfactory results as regards resistance against fungous diseases, now in our climate the most persistent foe of the apple. Continued and unremitting attention in the way of spraying with the copper solutions is needful now for growing most varieties to perfection, while some other and more thrifty and hardy kinds have strong resistant qualities, and give good results without such close attention and care.

Each variety has its own peculiar combination of qualities. Many sorts are such as make them desirable for eating out of hand, or for the table or dessert; yet, perhaps, these may not be classed as good market varieties. A kind that might be said to stand at the head of the list as a market apple, again, may be but comparatively an indifferent table fruit. A profitable apple here for a commercial orchard must be productive, and of good size and general appearance, as grown with ordinary good care and under ordinary conditions; must be of fairly good table quality, or near it, and withal a fairly good keeper. This is all that can be asked with any hope of finding here with us, and where we think that we can grow the apple as profitably, or more so, as a commercial fruit, than in any other section of the country.

Those of our fruit growers who are top grafting about everything in their orchards of this fruit, planted but a few years ago, to other kinds, can say with very good grace that the books or published works have been of little or no value as a guide to the proper selection of varieties for our climate and conditions.

Close observation and present experience have shown that here, near the sea level, the Dutch Mignone, Canada Reinette and Baldwin stand probably at the head of what may be classed as winter varieties for market purposes, and perhaps are more certainly to be depended upon to give regular and steadily recurring crops of good, marketable fruit than any other selection that could be made with our present experience. This list, however, could be quite largely extended to include sorts that would perhaps merit a place therein; among which I would name a russet variety to be found now and then in the orchards scattered over the northern counties of Puget Sound, but whose proper place in the nomenclature of this fruit is unknown. Most of the russet varieties are too inferior in size for the requirements of our markets, and also are too much subject of late, in our climate, to the effects of fungi.

In conclusion, it is safe to say that the observant orchardist, making the best selection that may be possible at the time of planting trees, will be quite sure to find in subsequent years that he may be able with great advantage to cut the tops off of a good many of them and re-graft to others, and as his experience may teach for his peculiar environment and location, to better and more profitable market sorts. Experience and close observation in this line is everything, the teaching of the books not so much.

A FEW SELECTIONS.

The following is a list of varieties recommended by Professor Balmer at the meeting of the farmers' institute at Sumner:

Summer varieties—Carolina Red June, Early Strawberry, Keswick Codlin, Red Astrakan, Sops of Wine, Yellow Transparent.

Fall varieties—Chenango, Gravenstein, Jeffries, Maidens' Blush, Duchess of Oldenburg, Wealthy.

Winter sorts—Baldwin, Ben Davis, Spitzenburg, Jonathan, Mother, Yellow Newtown Pippin, Northern Spy, Rome Beauty, Tomkins County King, Wagener, Winesap, Yellow Bellflower.

This list was intended more for planting in Eastern Washington. Professor Balmer thought that we could not grow a good late ripening apple on the west side of the Cascades.

BEST WAY TO KEEP APPLES.

We have had considerable experience and given much thought to the question. Our winters on Puget Sound, climate about as in England, have a more moist, humid atmosphere than is the case in the eastern states, and it is more difficult to keep apples well here. The main features to be observed in building a fruit house are: Thick, hollow walls, filled with sawdust, with tight outside and inside lining, with double doors and windows. Apples should be carefully picked early, so that the ripening process may not be too far advanced. Place at once in crated bushel boxes and carry directly to the house; handle as little as possible. These boxes should be stacked up in the house, leaving space between each row for ventilation. Ordinarily there should be as little assorting or handling of the fruit as possible, until it is ready to be sent to market.

Fine specimens for long keeping may be packed in dry sand, or in case of the russets, varieties liable to shrivel, in moist sand, which is the best method we know of. The doors and windows of the house should be thrown open during cold nights, and shut close and tight during days; the object aimed at being to keep the temperature equable and as near the freezing point as possible, and the room dark. With such a house and careful attention apples keep quite well, even in this climate, without the use of ice, which would be costly. J. F. CASS.

HOW TO HANDLE OUR PRUNES.

HINTS ON GRADING, EVAPORATING, AND BOXING THE FRUIT, AND SUGGESTIONS FOR UNITED EFFORTS IN KEEPING GOODS TRUE TO BRAND.

CHATFIELD KNIGHT, VANCOUVER, WASH.

In offering a suggestion on this important subject, I hope that even what is said here may lead to some practical system for handling, grading and marketing our evaporated prunes. The time is now at hand for some systematic method. The prune product of this state has already become one of great value, and it will increase from year to year. The first essential is to sustain our reputation as a prune growing state, and the next to market the product. How shall this be done? It is highly important that no fruit be placed on the market that is not properly dried and graded. Each box ought to be just what it is marked. The question is often asked, "How dry should the fruit be before it is ready for market?" This question is hard to answer, but is highly important, and can only be learned by observation. Many growers have made the mistake of drying insufficiently. In such cases the fruit will mold in a short time. The prune should be dried sufficiently to prevent molding when kept in an ordinary warehouse for at least one year. The local markets may use them in a less dried condition, but then it is always risky. If the fruit is to be kept for any length of time, then there is only one safe plan: Dry the fruit sufficiently to keep!

DRIERS AND METHODS.

In this section of the state the prune industry is the largest industry, and in fact is paramount to all others, there being about fifty driers in Clarke county, varying in size and construction, yet the most of them are constructed on pretty much the same plan. In the common box drier the heat is generated in a furnace below, rises, passes through the trays and out, after being loaded with moisture. The objection to these driers is that the trays of fruit nearest the heater will dry first. The heat passing through the fruit, absorbing moisture from tray to tray, is soon loaded and does little toward drying the upper trays. Such a drier requires close attention in order to get the fruit dried evenly, which is very important. The best plan so far, for this style of drier, that I have seen worked, is for the tray to be so constructed and placed on slides in a V-shape, each tray overlapping the one directly under it from four to six inches, so the heat is forced directly through each set, or practically so. Even with the improvement the fruit next to the heat vault will dry first and the trays have to be reversed. It seems that a perfect box drier has not yet been constructed, yet the best of them work very nicely. I believe that when one is perfected the cost will be nearly the same as that of a steam drier. So far as my observation goes the steam drier does the best work, and this is owing to the heat being generated and distributed more evenly among the fruit, which is the great secret of good work. How to get this with the least expense is the question that is attracting the attention of growers. It can be done, but the cost must be considered. The question is, what drier will properly dry 100 pounds of prunes the cheapest? As a purely business proposition, in estimating the expense of drying fruit we must estimate the cost of the drier, which is a part of the business as well as cultivating, picking, handling, etc. I believe it is not known as yet which drier will dry the cheapest, the common box or the steam evaporator. This also depends somewhat on the number of acres the grower has to handle. For small tracts I am convinced that the common drier is the cheapest, but for large tracts the steam evaporator will be used more extensively in the future, as the process is more rapid. The fruit should by all means be run through a grader before it is dried; each tray of fruit will then dry evenly. After it is sufficiently dried the fruit should be placed in piles and allowed to remain so until it has passed through the sweat. The length of time for this is easily ascertained. It should then be placed in the trays and heated for a short time. This process is generally considered the best and safest. There is quite a difference of opinion in regard to the length of time it requires to dry prunes; also what degree of heat with which to begin. This season I saw prunes dried that were "extra," where the heat was turned on in full force from the start. At another place I saw an extra quality where the heat was put on by degrees. I believe it makes but little if any difference, just so the evaporation is carried off, which seems to be all that is necessary for successful curing.

The method generally adopted, and certainly the best, for picking the fruit, is to have the ground under the trees nicely pulverized and smooth. Let the fruit drop, and pick from the ground. Do not shake the trees until the last picking. By this process one will get better fruit and more of it. The last few days that the fruit hangs on the trees it will take on flavor and richness, and when dried is more perfect. Before the prune is dried it is customary, and deemed necessary, to dip them in hot water and lye—one pound of lye to ten gallons of hot water. This checks the skin and the evaporation of moisture takes place more readily. After dipping in the hot water and draining a moment the fruit is then dipped in a tank of cold water, which washes off the lye. It is now ready for the trays.

I deem it very important in packing for the market to pack in the best boxes. Never in sacks. If we pack in a first-class box, in nine cases out of ten the fruit will arrive at the retail store in the same box, and retain its identity, brand, etc. If sold in sacks it will likely be boxed by some one, and possibly run through some process to add to its appearance, or marked from some other locality, which is often the case. Grading and packing should be done carefully and honestly. This will pan out best in time.

MARKETING.

If we expect to find a market and keep it, let us send our fruit out in a first-class shape. How can this be accomplished? I would suggest that each separate locality organize a union, incorporate, establish a union brand, not try to do too much at first, have all fruit properly dried, graded and packed by an inspector. This can be done if growers will unite their efforts. Let the selling be done by individuals, if so desired. I am convinced that the markets will find all such fruit if the quantity is sufficient. I urge the necessity of careful preparation, honest grading, and neat packing. Let us put up our fruit and pack it well in neat and substantial packages. This is enough for a local union to undertake at first. If this part of the business is carefully looked after and guarded success must follow, otherwise the union will surely be a failure. An individual grower can establish a reputation for his fruit, as many have done in this vacinity, but united effort is better. Buyers will be attracted to a locality united on careful methods. Again, if one lot of fruit, badly prepared, should be sold in any of the markets it will damage the prospect for future sales from that locality. In conclusion I will say that if we use good judgment and are honest in preparing, grading and packing, our goods will find a market.

THE PLUM ON PUGET SOUND.

Of all the different species and subspecies or varieties of fruits common to the Puget Sound region or country, probably none are grown to such perfection, comparatively, as those of the plum kind. Each fruit finds its best environment in diverse conditions of climate and locations, as regards altitude, sunshine and temperature, during the growing season. While we on the Sound, under our conditions, cannot produce as finely colored and appearing an apple as may be grown in certain favored localities in the more eastern parts of our state, and which can well outdo us in that line, yet we seem to have the conditions to surpass any other district of country in the production of certain other fruits, and notably the plum. The finer European sorts of this fruit are here grown to such perfection as to give ourselves, together with a few other localities on this coast limited in extent, a more or less of a monopoly in the production of the plum kind. In the larger area of the fruit producing parts of the United States the growing of the finer varieties of the plum is not practicable, and only the inferior, smaller and curculio proof of American and Japanese sorts can be successfully cultivated.

Many of the larger and most showy varieties of the plum are also fine shippers in their fresh and ripe condition. As grown with us their fine appearance as a market fruit commands for them a high price in eastern cities, as was fully shown in the shipments made last season from Puget Sound points, and such fruit in every case brought large and quite favorable returns, while shipments of the Italian prune, a fine but smaller and less showy plum, in most cases brought but about one-half of the prices of the other larger varieties, and little more than the expense of packing, shipping, etc.

Hence, profiting from this experience in shipping to eastern markets, and from our natural advantages in growing this class of large, showy plums, we ought to plant here largely of such kinds as Pond's seedling, a very large and fine appearing, productive and good shipping variety. The yellow egg is a very large and very taking sort. The Columbia is a good shipper, and profitable. The above kinds are good shippers, vigorous and good growers, hardy and productive. Many of the finer kinds of the plum lack vigor in the growth of the tree, and are often failures in this respect, and in planting commercial orchards this point should be kept in view.

A deep, loose and strong soil should be selected for growing the plum. And if the orchard is in near proximity to the banks of one of our rivers that have the habit of rising bank full and subirrigating the adjacent fields during the early summer, or at the time of the June freshets, all the better, as trees bringing to maturity a crop of ten to thirty tons of fruit or more per acre draw largely upon the water supply in the soil. The writer's plum orchard, on similar soil, of young seven-year-old trees, produced twenty-seven tons of fruit from three acres last season.

The Fellenberg plum (Italian prune), planted largely on Puget Sound, is wanting in two respects: It fails to bring the high prices of the more showy fruit in the eastern markets, and also fails to produce crops in seasons in which showery weather prevails during the blooming period of the trees. In both of which features Pond's seedling (Hungarian prune) is much superior. This last plum is perhaps the best market variety to plant of the whole list for shipping east in the fresh state. J. F. CASS.

APPLE AND CHERRY PESTS.

THE DEAD SPOT ON APPLE AND THE CHERRY GUMMOSIS.

Among the various pests and diseases that our fruits and trees are subjected to here, perhaps none are so prevalent at the present time, or so injurious in their effects, as what is known as the dead spot of the bark disease, affecting the apple tree principally, and less commonly the pear tree. It is now very common in most localities in the Puget Sound region. This disease first appears at the close of winter, or at the beginning of the growing season, the tender bark of the trees showing dark dead patches, at first quite small and rapidly extending in dimensions, and at times entirely encircling the stem or branch of the tree. When this occurs, of course, all that portion of the tree or branch above the dead patch dies. But as a general thing these dead patches do not exceed a few inches in length, and about one-half that in width. If these dead patches of bark are early in the season slit with the point of a knife in several places, new wood and bark will invariably form and grow beneath the old decayed tissue and the dead spot will heal over and become effaced in a short time.

The disease is believed to be of fungus origin, and that sprays of sulphate of copper solutions will act as a preventive, As yet but little is known as to the nature or cause of the disease, or as to the best remedies. The use of a strong alkaline or soap solution as a winter spray is strongly recommended because of its effect in leaving the bark of the tree bright and clean, allowing the presence of the disease to be quickly noticed, when, by the slitting of the bark, its evil effects can be guarded against or avoided entirely.

Of the gummosis of the cherry tree, or the bursting of its bark and the exudation of a gummy matter therefrom, and which is by some thought to be closely allied to the bark disease of the apple tree, still less is known. Should the cherry be grown upon a soil deficient in drainage, or having a hardpan or impervious subsoil forming a pocket and holding the water, the tree soon gives evidence of disease, and the gumming shows as one of the first symptoms. Experience teaches that there are but few conditions of soil, etc., that seem properly adapted to a continued healthy growth of the sweet varieties of the cherry, the sour kinds being more hardy in this respect. A loose and naturally thoroughly drained soil is indispensable to its healthy and perfect growth. The higher and drier river valley soils are the best adapted for successful cherry growing, the trees in such soil and situation being comparatively free from the attacks of disease or insect pests. J. F. CASS.

NEW VARIETIES OF FRUIT.

Sometimes a new variety is introduced to the fruit-growing public that is of value—perhaps one or two such in a generation or so—that is, that have points of superiority over the older standard sorts. Of course many new and curious things are brought out every year that have value to those nurserymen and dealers who make it a business of introducing "novelties," and of publishing catalogues with the gorgeous illustrations and descriptions of circus posters for the admiration of a certain class of country people; but as a rule those newer productions in their line are of no real value except to those who make a good thing out of them as high-priced novelties.

The Bing cherry is now being planted to some extent here and in Oregon. It is without doubt a better market variety than most of the older kinds usually grown. Its superior size and fine shipping qualities are such that in shipments made to eastern markets it brought nearly or fully double the prices obtained for such kinds as the Black Republican and Royal Ann. It is much larger than these varieties. In our home markets it is also eagerly sought after. I think that this cherry will be the most largely planted of any during the next few years. It has been tested for quite a number of years, and if it continues to give as good results in the future, will be the most desirable variety of all to grow for market purposes. The trees are not held at fancy prices by the nurseries. J. F. CASS.

A STRAWBERRY BED ON A BARREL.

A UNIQUE SCHEME FOR CLOSE CULTURE.

The idea of growing strawberries on a barrel, is, probably, a novelty to most people; yet the plan is being quite extensively introduced in our village, by Mr. E. O. Hall, who is an expert gardener and nurseryman. Having experimented for several years in the different methods of growing strawberries, I became interested in Mr. Hall's plan. I obtained an interview with him, and he gave me a full description of his barrel method in detail, which is as follows:

The barrels for this purpose are made of hard wood and strongly bound with iron. Linseed oil barrels are preferred. The outside of the barrel may be laid off in four-inch squares. Commencing about two inches from the bottom, inch holes are bored in the centers of the squares, horizontally around the barrel, making 27 holes in the row, four inches apart. Five rows of holes are bored around the barrel, eight inches apart, or in each alternate square. The second row of holes from the bottom is bored on the perpendicular lines, and so on, alternately, to the top of the barrel; in this way holes are bored for 135 plants. Ordinary bedded plants are used, of any variety desired, mixing the perfect and imperfect varieties as in garden culture.

The barrel is filled with soil to the level of the first row of holes, putting in rich garden soil with a little well-rotted manure thoroughly mixed with it. The plants are next inserted through the holes with the roots a little higher than the stems, to allow for settling. The roots are well spread apart, and more soil is put in, and firmly packed over them. A little water is sprinkled on them, and the process continued until the barrel is filled, when it is covered to prevent the escape of moisture.

In watering the plants, care should be taken not to keep them wet. The better way is to make several holes down through the barrel with a stick, and pour in water or liquid manure according to the needs of the plants, giving them more during the time of fruiting. The advantages of the barrel method of growing strawberries are that no runners grow, and the whole strength of the plant is directed towards growing fruit. The berries are perfectly clean, all cultivation and weeding are dispensed with, and there is a great economy of space. If the plants were spread out as in garden culture, they would occupy nearly one square rod of land. The plants may be put in either in the spring or fall. If they are put in during August or September they will yield nearly a full crop the next year, and will continue to bear for four or five years without renewal. Five bushels are the maximum yield, and three or four the average, depending on the variety and management.

A good exposure to the sun is desirable, although they will do very well in partial shade. It is advised that the foliage of the plants be occasionally sprinkled, and in the winter, a light covering of straw thrown over the barrel. Mr. Hall has been working at this business for eight years, and has set up over 1000 barrels, and, as far as he knows, his work has been a success. The most of them were for city people, a large number in the city of Brooklyn.

This plan of growing strawberries seems to be well adapted to people living in villages and cities; who have no gardens, and make it possible for any one to grow his own strawberries, who has a space of three feet on which to set a barrel.—*Rural New Yorker*.

ROADSIDE AND STREET TREES.

Roadside and street tree planting in our state seems to offer more widespread inducements even than the establishment and growing of orchards. Such trees require no outlay for the first cost and preparation of the soil in which they grow, and they largely enhance the appearance and value of the farm or village lot whose front they may grace or ornament. As a wind break a row of such trees is often of very great value, and in places almost indispensible. And in our climate there is no reason why such trees may not be often as profitable in the way of fruit production as others.

If the soil and location is suitable the large-growing sweet cherries will do as well in all respects here on Puget Sound, growing in the roadside grass borders as on the best prepared orchard lands. The writer has a double row of these along the road and river front of his orchard, and they are among the best trees on the place. The Spanish chestnut is one of the most valuable of all trees for this purpose. It is right at home in this climate, makes an exceedingly handsome tree and is very productive. Quite large specimens of these can be seen growing on a certain street in Tacoma, whose branches are loaded with nuts in the autumn season. The English walnut makes a still more rapid growth, is a beautiful tree, and perhaps with age would also yield a good return as a nut producing tree. The black locust is one of the most thrifty and handsome trees for street planting here with us in the whole list. J. F. CASS.

KEEP THE CODLIN MOTH OUT.

Certain districts in Central and Eastern Washington stand at the head, perhaps, of any portion of the American continent for the growing of the apple as a commercial product. The bright color and general fine appearance of this fruit produced in those sections are unsurpassed. A prominent horticulturist and pomological authority, Col. Babcock, as judge of the pomaceous fruits at the Columbian exposition, at Chicago, became so impressed with that fact that he afterwards removed to this state for the purpose of entering largely into the production of this fruit. The time will doubtless soon come when the apple product of the Yakima, Wenatchee and other districts of our state, will be of the largest importance, and will overshadow in extent and value many of the other great interests and industries that we at present possess. Not even the great red apple producing table lands of the Ozark mountain region of Missouri will be able to enter into equal competition with these favored sections in growing the high class fruit that takes the market to itself wherever it comes.

Fruit growers in these naturally favored sections, and the above mentioned are referred to because they are as yet comparatively free from insect pests, and which cannot be said of some older and in some respects equally favored localities of the state, should use every endeavor to keep out the codlin moth, and to prevent its becoming prevalent or even introduced into their orchards. This insect when wide spread is ruinous to the apple growing interests of any region, and when once introduced and prevalent is difficult at best to keep in check. J. F. Cass.

THE EFFECTS OF FUNGI.

During the last two or three years complaints of the cherry in Western Washington as shedding its fruit has been somewhat common. Before the fruit is fully grown a large proportion of the crop shrivels up and falls to the ground. This is doubtless the effects of fungi. The Black Republican seems more subject to its influence than the Royal Ann variety. The proper course of treatment is spraying thoroughly before the buds expand in spring with the salt, sulphur and lime, or a strong bluestone solution. Trees also ought to be sprayed with the Bordeaux mixture just before the petals of the blossoms open out ; and again when the fruit is partially grown.

The effects of fungi is also largely observable in the past few years in Western Washington upon the bloom of many varieties of pears, and also upon some of the less resistant kinds of the apple, blackening and destroying the blossoms as by an untimely frost, or so weakening the vitality of the embryo fruit as to cause it to wither and fall from the tree. The above sprays are now found to be essential to ensure a crop of some kinds of these fruits during adverse seasons ; the effects of fungi being much

S.R.F.G. ASSN. ORCHARD WAWAWAI. WASH

more prevalent when the spring season is cold with continued showry weather.

The curling of the leaves of the peach tree and among others, of some varieties of the Japanese plums, being evidence of the effect of fungi upon the foliage of the less hardy and resistant forms of tree growth, may also be successfully treated by the application of these sprays. J. F. CASS.

THE GOOSEBERRY.

It is one of the curious things in the horticultural art that the American people do not take very kindly to the gooseberry as a fruit for general cultivation. In England the gooseberry has almost the first place in common estimation. The principal reason perhaps for the neglect of this fruit among the American people is because the fine large varieties known as the "English gooseberries" do not thrive in the climate common to most of the states. Here on Puget Sound, however, many of the best of these are right at home. And the principal American varieties are twofold more productive and better in other respects here also than in the eastern states. Of the latter class the Oregon Champion in most respects is the best variety. Some one making a specialty of the growing of the finer English kinds to send to market in the well ripened form (some of these are as beautiful and as tempting as peaches), and the American varieties in the green condition for sauces, has the opportunity of insuring to himself a good income from a small area of land. The gooseberry here is among the most productive and certain yielders of all the fruits.

PRESERVATION OF THE FRUIT.

Dr. Hoskins, of Vermont, who is a well-known authority on fruit growing in the New England states, says:

"A considerable demand for green gooseberries is for bottling, and if it were generally known that the fruit can be perfectly preserved the year round in common bottles, with pure water, requiring only to be well corked and kept in a cool place, many more would be called for. All that is required is to examine well that no jammed or crushed berries go into the bottles; that cold spring or well water be used for filling bottles, and that they are well corked (they need not be sealed), and kept in a cool cellar. Thus prepared they keep perfectly, and are an acceptable and very cheap material for pies in the winter season.''

SOME INSECTS AND DISEASES INJURIOUS TO FRUIT TREES AND THE FRUIT INDUSTRY, NOT YET INTRODUCED OR COMMON IN THE STATE OF WASHINGTON.

Our state fortunately, in common with others of her sister states on the Pacific coast, is yet free from some of the worst of the insect enemies and diseases of fruit trees that are more or less common to the other states of the union; but it is only a question of a strict guarding of our interests and industry that we can claim exemption in the future. It is now some years since our legislature gave authority into the hands of the state board of horticulture to in a measure quarantine and guard against both the incoming of new forms of pests and also for the preventing of the more extensive spread of such dangerous pests as had already obtained a foothold in some portions of the state. For several reasons, it is needless to say, that any quarantining or strict oversight or prosecution of the work seemingly required in this line here in the state, has not been such as might have been properly demanded in the interests of our rapidly growing fruit industry.

THE CODLIN MOTH.

The case of the codlin moth pest, the worst enemy of the apple grower in the state, is instanced. In districts where this insect is fully prevalent apple growing, as a profitable industry, will have practically to cease. The insect is a difficult one with all present known remedies to keep well in check when thoroughly disseminated. Some of our best apple districts are yet almost or wholly free from its presence, and the growers in such sections should use all exertions to keep it out of their orchards. Our Puget Sound orchards especially are as yet generally free from the codlin moth. Yet, unfortunately, in the markets of Tacoma and Seattle a large proportion of the apples and pears brought in from Oregon, California, and also from the eastern states, are badly infested with the larvæ of this insect, and if such continues to be the case, of course, it will be but a question of a few years when our orchards adjoining will be probably swarming with this pest. The present season a vigorous attempt was made in Seattle to enjoin the sale of such infested fruit, not meeting, however, with that encouragement from fruit dealers and the general public that such an endeavor should have secured. Should the incoming legislature make provision for the prosecution of the work, no doubt but what an attempt will be made to put a complete embargo upon the sale or distribution of such infested fruit in the future. And this particularly in the interest of such portions of our state as are yet free from this most pernicious insect.

THE GIPSY MOTH.

(*Ocneria dispar.*)

In 1868 this insect was introduced into Massachusetts from Europe by an individual for experimental purposes. It has spread and proven there of such damage to their state as to cause them to expend several hundred thousand dollars since in combatting them. In one year alone $300,000 was appropriated for the work in that state, and $200,000 is asked to further carry it on the present year. Whether they can do more than to temporarily prevent its spread is questionable as yet. The insect feeds on the leaves of all the deciduous trees. The ultimate and permanent damage to the interests of that state caused by the incoming of that insect is hardly calculable.

THE PLUM CURCULIO.

(*Canotrachelus nenuphar.*)

One of the insects, whose incoming here to the coast is mostly to be feared, is the plum curculio. It is the most injurious of all the pests known to the plum family of fruits, and should it become prevalent and widespread on this coast, where it has yet failed to get a lodgement, it would mean the destruction of our prune industry. This coast has now a monopoly of the production of this fruit in the United States because of this fact of exemption from the presence of this insect. It has been common in the eastern states for one or more generations and practically keeps in check there the cultivation and production of the finer European varieties of the plum kind, except in a limited way, as no effectual remedy has yet been discovered to prevent its ravages.

"This insect is a very dangerous pest, and the most injurious known to the plum family. It abounds throughout the eastern states, where owing to its ravages, the culture of the plum and apricot has almost been abandoned. It also attacks the peach, the cherry and the nectarine. So far it has baffled all efforts put forth to combat it. No effective remedy has as yet been found. We have exercised the greatest vigilance to prevent its introduction into our state, for should it appear here the prune interest would suffer immensely, and its culture would have to be abandoned." (Report California State Board of Horticulture, 1893.)

THE BUD MOTH.

Tmetocera ocellana.

This insect is of late becoming a great pest in some of the largest apple growing districts of the eastern states, and should be watched carefully for here. It is considered in New York state to be one of the most destructive to the orchards there, and also one of the most difficult to combat. It was first discovered in the east in 1869, and has since been found in some of the other states and Canada.

"This bud moth has come to be recognized by many of the most extensive apple growers in Western New York as the most injurious and hardest to fight of any insect now present in their orchards. It works in the opening leaf and flower buds, and often nearly the whole crop on many trees is destroyed while yet in the bud. It is also especially destructive when it attacks newly budded or grafted trees and nursery stock. Besides apple, it also feeds upon pear, plum, cherry, quince, and peach trees and blackberry buds. Thus the fruit growers have to fear in the bud moth, a pest which is capable of literally nipping in the bud a prospective crop of fruit, a graft, or budded stock." (Bulletin No. 107, Cornell University Experiment Station, p. 57.)

This insect has so far proven very hard to combat, and no effective remedy has as yet been discovered.

NEW FORMS OF INJURIOUS SCALE INSECTS.

The scale insects infesting vegetation are very numerous and new varieties found on fruit trees and plants coming in on the steamers from the Orient are quite commonly observed each season by Mr. Craw, the efficient quarantine commissioner of the California State Board of Horticulture, who closely examines all such arrivals to that state at the port of San Francisco. The greater number of these new varieties of late come in on trees and plants from Japan, and also to some extent from Australia. Mr. Craw has lately described, in the last California Horticultural Report, 35 or 40 distinct forms of these destructive scale insects, nearly all of which has recently come under his notice as being found on shipments or specimens of fruit trees or plants coming into the country from foreign sources. Some of these are found to work exclusively upon the citrus family of fruits, and therefore of not so much interest to us in this state, but a large proportion of them are known to infest also the deciduous fruits and the trees and shrubbery common with us, and as a safeguard to our fruit interests we cannot be too careful about their getting a foothold with us here. Many of these scale insects are among the most difficult to destroy if infesting trees, and in California the hydrocyanic gas treatment is the one mostly used. This requires a large tent covering to envelope the whole tree. under which the gas is generated, and needing several men to handle the outfit complete, making the cost of treatment quite a large one.

THE PEACH YELLOWS.

This, one of the most destructive forms of diseases affecting any family of fruit trees, fortunately is not common with us on this coast. Where this disease exists the peach growing industry is destroyed. Bulletins have been issued both by the Oregon and California State Boards cautioning against the importation into their states of trees from any of the districts where it is known to exist.

"Yellows is a distinct disease. It attacks peach trees of all ages and in all conditions of vigor, seeming to have preference for those which are thrifty. It is *incurable*, and its termination is always fatal. It is communicable from tree to tree. Extermination of all affected trees, root and branch, is the only method of keeping the disease at bay." (Prof. L. H. Bailey, Bulletin No. 75, Cornell University Experiment Station, 1894, p. 406.)

"In peach growing states now free from the disease, it would be wise to prohibit the introduction of all trees from infected areas. Certainly, if yellows does not now occur in California (and by diligent inquiry I have failed to ascertain that it does), the greatest care should be taken to prevent its introduction, even to the extent of legislation, strictly prohibiting the importation of peach trees from the eastern United States. Unless such steps are taken the appearance of yellows in orchards on the Pacific Coast is only a matter of time." (Bulletin No. 9, Section of Vegetable Pathology, Department of Agriculture, 1891, p. 177.)

PEACH ROSETTE.

The peach rosette is another form of disease that is found in some of the eastern states, and is as much to be feared as the yellows. The disease also appears to be fatal to the plum family of fruits, or at least to some varieties, and hence would, perhaps, be more destructive to our fruit growing interests on the whole than even the yellows, should it come into the state.

"The disease runs a rapid course, and is believed to be nearly or quite as dangerous as peach yellows, although less widely distributed. Growers are advised to root out and burn affected trees as soon as discovered." (Report Department of Agriculture, 1891, p. 370.)

No known remedies exist for either of those diseases. Our immunity here on this Pacific Coast from so many of those described and among the worst of the insect pests and diseases of fruits and fruit trees gives us immense advantages in the line of fruit production, and which we should take every means available to retain. The question of preventing their incoming and spread with us is a matter of great interest and of the most widespread importance to our fruit growing industry.

J. F. CASS.

CULTURE OF THE STRAWBERRY.

Among all the fruits that are common with us here perhaps none seems so indispensable as the strawberry. It fills a place that none other does. It is the first of the yearly production that comes to our tables, and none can vie with it in its fragrance and ambrosia-like combination of sweets and acids. Withal every one may have it, as it is the most easily and cheaply grown of any. The plants come into bearing within a few months after planting, and it asks but a very small part of the earth's surface for its habitation and but a modicum of Sol's rays to insure its annual production of luscious fruit.

There are some points in connection with its easy and successful cultivation as a garden crop that are not well enough understood. A very rich and well prepared soil and plenty of water in the fruiting season, if the soil is naturally dry, are the prerequisites for the obtaining of an abundant supply of berries. And in our climate of open mild winters this will imply also a large and persistent growth of grass and weeds. That arch enemy of other herbacious forms of vegetable life, the little white clover, will come in, and in the end will run out all other plant growth, strawberries and all, unless kept in check. Now, this clover is the most deserving and valuable product of nature to man and other animal life, but not when growing in a strawberry bed. It must be rooted out, or better, not allowed if possible to come in at all. If once in possession of the ground it will be better to turn all under with spade or plow and commence over again.

Altogether, the best method of treating a strawberry bed that has come under my notice is, after setting the plants (better in hills, say two feet apart in rows three feet distant from each other), to cover the whole plot several inches in depth with sawdust, leaving only the crowns of the plants above the surface. This will accomplish a threefold object—as a mulch, protecting the vines from drouth, insuring against weed growth, and protection of the fruit from soiling from contact with the earth. No one after seeing the advantages of this method in actual use will ever in our climate attempt to grow strawberries in any other way.

To city and town residents there is another plan of growing this fruit lately recommended that seems quite practicable. If one has only a piece of board walk, or paved street even, with sunshine and water, he can grow the berries in abundance in the following way, from a correspondent of the Rural New Yorker:

THE BARREL METHOD.

"BARREL AND SOIL.—Take any strongly bound hardwood barrel. Lay off the outside of the barrel in four-inch squares, as you would mark a checker board. Begin at the bottom of the barrel and bore a row of inch holes in each square horizontally around the barrel. In this way bore five rows of holes around the barrel, eight inches apart, or in each alternate row of squares, boring the second row of holes from the bottom on the perpendicular lines instead of in the squares, and so on alternately to the top. Five rows of holes with seventeen in a row will give you eighty plants to the barrel. The barrel is filled with soil level with the first row of holes, using rich garden soil with a little well rotted stable manure thoroughly mixed with it.

"PLANTS.—Ordinary bedded plants may be used, of any variety that is desired, mixing the pistillates and bisexuals, as in garden culture. The Sharpless, with a small mixture of Crescents, give very large berries when grown in this way; also the Bubach and Marshall. But for quality of fruit I have found none better than the Cumberland Triumph and the old Charles Downing. The latter two are bisexual, and need no other varieties to fertilize them. Any other varieties well adapted to the local climate will do. The plants are inserted through the holes, with the roots a little higher than the stems to allow for settling. The roots are well spread apart, and more soil is put in and firmly packed over them. Then they are sprinkled with water, and the process continued until the barrel is filled, when it is covered to prevent escape of moisture.

"It might be well to try the Clarke's seedling, also some of the famous Magoon plants.

"TREATMENT AND ADVANTAGES.—In watering care should be taken not to keep the soil too wet, and the better way is to make a few holes down through the barrel with a stick and pour in water or liquid manure according to the needs of the plant.

"It is well to set the barrel on a box, or something to elevate it from the ground, to prevent insects from getting at the berries, and also occasionally to sprinkle the foliage on the outside of the barrel.

"The advantages of this method of growing strawberries are that no runners grow, and the whole strength of the plant is directed to growing fruit. The berries are perfectly clean, and all cultivation and weeding are dispensed with and economy of space secured. If the same number of plants were spread out as in garden culture, they would occupy nearly a square rod of ground.

"The plants may be put in either in spring or fall. If in August or September they will yield a fair crop the next year, and will continue in bearing four or five years without renewal. Five bushels is the maximum crop, and perhaps three or four the average to a barrel, but the yield will depend upon the variety and management."

J. F. CASS

AN IDEAL APPLE ORCHARD.

The ideal apple orchard is one that is planted on a first class soil, and of properly selected varieties, and then having had the young trees forced into a fairly good growth by judicious cultivation of the ground the first few years. When in full bearing, and if the soil is fully supplied with moisture, it is better seeded to grass, preferably clover, and pastured with sheep. This ensures a not too excessive growth of well ripened wood that will resist effects of sudden and severe changes of temperature, and the keeping in check, where these prevail, of the codlin moth — the sheep eating the fallen fruit destroys the greater proportion of the larvæ of the insect that otherwise would remain in the orchard to infest the succeeding crop. This is one of the most practicable methods of controlling the depredations of this insect. The trees then carefully pruned and sprayed each year will result in giving an ideal and profitable orchard under the conditions prevailing here generally on the northwest Pacific Coast, especially on the west side. The trees can be protected from the bark-eating habit of the sheep by narrow sections of the common wire poultry netting wrapped around their trunks, or in other ways that will suggest themselves to the practical man. The trees will require to be branched or headed higher under this system of management than the otherwise ideal methods of pruning would call for, but in this case the ideal must to a certain extent give place to the practical, and in truth the practical is the highest type of the ideal. J. F. CASS.

GRAFTING WAX.

Much needless pains and expense in the first cost and preparation of this is often taken. When much grafting is done the cheap rosin known as "pitch" is as good as any. Boil this in sufficient linseed oil or tallow to make the wax of a consistency so that when cold it will not be brittle or crack, and not so soft as to melt or run with the heat or in the sun. A small proportion of beeswax will improve it, but this is not essential. This kept warm in a common glue pot and applied with a small brush or swab is the most expeditious and efficient method of covering the cut surface of a grafted stock. Any large cavities in cleft grafting can be filled with a putty of clay before applying the wax over all.

CLASSES OF PESTS.

Almost all the serious pests that attack plants are either insects or fungi. These we may classify, according to their way of attacking the plant, into a number of groups, as follows:

1. *Root-feeding insects*, which attack the roots of plants; they may devour the roots, suck the sap, or cause swellings to form; and the same insect may even attack the plant above ground as well as on the roots.

2. *Boring insects*, which live within the plant and mostly attack the stem or trunk, but may also bore into the larger roots on the one hand and into the interior of the leaves and fruit on the other.

3. *Sap-sucking insects*, which attack the upper parts of the plant, puncturing the leaves and stems to obtain their food. These resemble the forms that suck the sap from the roots, but the latter are a different and much more difficult economic problem.

4. *Defoliating insects*, which eat up the leaves and other green parts of plants.

5. *External fungi*, growing over and living upon the exposed parts of the leaves and stems of plants, and only sending feeding suckers into the plant.

6. *Local fungi*, which enter the plant, but remain at the point where they found an entrance, and only spread by the spores, which correspond to seed, being carried to other parts of the leaf or plant and there growing into the plant again.

7. *Penetrating fungi*, which have the power of passing from

one part of a plant to another by boring their way right through the plant.

Each of these classes of pests must be treated in a different way, and usually the remedy for one would be entirely useless if applied for a pest of another class.

MISTAKES MADE.

The chief mistakes made in applying remedies are the following:

First — Applications are often made when there is absolutely no need for treatment — when there is nothing to destroy or prevent.

Second — Applications are wrongly timed often; either applied before there is a chance to produce good results, or after the injury has all been done.

Third — Often the wrong kind of an application is chosen for the particular trouble, so that no results can follow.

Fourth — Applications are often made for troubles that are incurable by any known practical method.

Fifth — Extensive methods are employed when cheaper ones will accomplish the same results, both as regards the material used and the labor employed. (*Prof. Woodworth, University Cal.*)

GROWING THE PEACH ON THE PLUM.

In the western portions of the state, especially where the climatic conditions are not the most favorable for the growing of the peach, and because of the prevalence of the "curl leaf," now that a remedy is found for this in the Bordeaux mixture, there seems no reason why this fruit may not be grown with considerable success. Hale's Early variety has been found to be especially adapted to the coast regions.

It has been recommended by C. L. Whitney, of Walla Walla. to top-graft the peach on the plum to ensure the greatest success. We think this a good suggestion, and would bud into the principal shoots of the young trees, after the same became well branched, of the finer varieties of the plum family, so that should the peach become winter killed as the effect of any abnormal freeze, as sometimes occurs, the main tree will be left to the orchard. The peach on the plum may be said to make a more hardy tree, and one adapted to be grown on a greater diversity of soils.

J. F. CASS.

CLIMATIC INFLUENCES, ETC.

There are certain climatic influences so broadly marked here in the State of Washington that the fruit grower in planting an orchard should at the outset make them a study.

Because of the humidity of the atmosphere in Western Washington fungous diseases, attacking both the foliage and fruit, is much more common than in the drier air of the eastern part of the state. Hence more attention should be given in that region to the selection of varieties as are found to be more resistant to such influences. On the other hand it may be said that the conditions of climate of Eastern Washington are more favorable for the reproduction of insect pests in general, and such as the San Jose scale, and more attention will be needed there for the keeping of them in check.

Eastern Washington is the home of the red apple in its finest garb, while we here in Western Washington can grow the yellow and russet varieties in great perfection.

Mistakes have been made largely in the Puget Sound districts in planting varieties of the plum and prune family that are late in ripening, and some of the finer sorts of the prune as there grown are found wanting in this respect. The French prune, while comparatively worthless west of the mountains as a commercial fruit, is in perfection in the drier eastern region. The same to a certain extent is also true of most of the late ripening sweet varieties of this family of fruits. This is an effect of the heavy dews and early fall rains common to the western slope, causing the fruit to crack and burst open before fully maturing.

The cherry finds its most congenial home on the western side of the Cascades and grows to the greatest perfection there. The climate of Western Washington is also peculiarly fitted for the production of the small fruits in general, while most of them thrive equally as well in the eastern part of the state.

The horticultural effects of climate, location, altitude, topography, etc., of the state, is largely what should control when selecting varieties of fruit to plant on any extended scale; and as the results of close observation and extended experience the knowledge of these becomes available. J. F. CASS.

THE BEST WORKS ON HORTICULTURE.

The generally accepted standard horticultural works of the eastern states may be said to be: "Downing's Fruit and Fruit Trees of America," "The American Fruit Culturist," by Thomas, and Barry's "Fruit Garden." The first named is noted for its full and complete descriptive list of the various fruit varieties. The "American Fruit Culturist" is perhaps the best single published work for the average practical or amateur orchardist, while the work of Barry, in special lines, is almost indispensable to the fruit grower.

ROOMS OF THE STATE BOARD AND GENEROSITY OF THE NORTHERN PACIFIC RAILWAY CO.

The rooms of the State Board of Horticulture at Tacoma are in the Northern Pacific Railway Co.'s Headquarters Building, opposite the City Hall. Here may be found a large collection of the different fruits, in glass jars, as near as may be in their natural condition, and various specimens of the grains and grasses as grown in the state. They are added to from time to time, the aim being to exhibit the resources and capabilities of our state in the production of these. In another large room connecting with this are exhibited an extensive collection showing our mineral resources. The three rooms, one being used for the office, comprise the headquarters of the board, are on the Pacific Avenue ground floor front of the Northern Pacific Railway Co.'s principal building, and are generously donated to the use of the board and state, together with heat, light and water. A large proportion of the exhibits also are the property of the railway company, and who in many ways contribute to the upbuilding and the prosperity of the state and the northwest Pacific Coast in general.

ACT RELATING TO HORTICULTURE.

[CHAPTER CIX, SESSION LAWS 1897.]

AN ACT to promote and protect the fruit growing and horticultural interests of the State of Washington, to provide for the appointment of a commissioner of horticulture; to repeal certain laws in conflict therewith.

Be it enacted by the Legislature of the State of Washington:

SECTION 1. A commissioner of horticulture shall be appointed by the governor. It is hereby provided, prior to appointment, the applicant must furnish a certificate from the faculty of the college of agriculture that he is a skilled horticulturist; on such certificate the governor may make the appointment. Before entering upon the discharge of his duties said commissioner shall take and subscribe an oath to support the constitution of the United States, and the constitution and laws of the State of Washington, and to faithfully discharge the duties of his office, which said oath, together with the aforesaid certificate, shall be filed with the secretary of state. Said commissioner shall keep his office at Tacoma, which shall be open to the public during normal office hours, every day excepting Sunday and legal holidays and days when he may be necessarily absent attending to official duties in other parts of his district.

SEC. 2. The object for which said commissioner is appointed is to maintain and exercise a supervisory directory over the horticultural industries of the state, to enforce the laws relative to the importation, transfer and sale of fruit, fruit trees, plants or nursery stock within the state, and to give such instruction to fruit culturists regarding cultivation, and the extermination of fruit pests, as the nature of the case may demand. The official term of the commissioner of horticulture shall begin on the first day of April, 1897, and continue for four years and until his successor is appointed and qualified. Said commissioner shall receive annually, in full consideration of his official services, the sum of $1,000, and for incidental expenses of his office, such as necessary traveling fare, stationery and postage, the sum of $500, or so much thereof as shall be actually expended. Each of said sums shall be due and payable in monthly installments in warrants drawn by the state auditor on the state treasurer.

SEC. 3. Said commissioners may be removed from office at any time for cause, such as inefficiency, neglect of duty or immoral conduct, but no removal from the office of commissioner of horticulture shall be made for political reasons. Vacancies occurring in the office of commissioner during a term shall be filled by the governor making an appointment for the unexpired term, under rules and regulations as prescribed in section 1 of this act for full term appointments.

SEC. 4. Fruit culturists in any county in this state are hereby authorized and empowered to organize into a county horticultural society, and the better to promote and protect the horticultural interests of the county, the society will nominate a qualified person for county inspector of fruits, trees and plants, and of insect pests destructive to the fruit interests of the county. The nomination shall be made to the board of commissioners (of the county wherein said society is organized), who are hereby authorized to appoint such person as county fruit inspector, deliver to him a certificate of his appointment, and mail a duplicate copy of such certificate to the said state commissioner of horticulture; said county inspectors shall be entitled to a per diem of two dollars for each day's actual service, to be paid by the county in which said inspector is appointed.

SEC. 5. No person, firm or corporation shall engage or continue in the business of selling within the state, or importing fruit trees, plants or nursery stock into this state, without first having obtained a license to carry on such business in this state, as in this act provided: [*Provided*], That this section shall not apply to any person or persons who may from time to time sell or give away any fruit trees, plants or nursery stock the growth of which shall be the result of his or their own industry, and where such sales are made without canvassing, soliciting, advertising or the employment of agents.

SEC. 6. Any person, firm or corporation may obtain a license to engage or continue in the business of selling and importing fruit trees, plants or nursery stock into this state by submitting his application therefor to the commissioner of horticulture, together with a satisfactory bond in the sum of $1,000, to be approved by the said commissioner, conditioned that the principal and his or their agents will faithfully obey the provisions of this act and the laws of the State of Washington, and that the said principal will pay the cost of inspection and destruction of all infected nursery stock or other material or goods imported into or sold within such district of this state, by the said principal or his or their agent. Licenses granted under this act shall be for two years or less, at the discretion of the commissioner.

SEC 7. It shall be the duty of every person, firm or corporation licensed to do business under this act to notify the commissioner of horticulture of his intention to ship an invoice of fruit trees, plants or any nursery stock from one point to another within the state, or to import an invoice of similar goods from without to any point within the state, whether for the purpose of sale or for personal use. Such notice shall contain the name and address of both the consignor and consignee, and a descriptive invoice of the goods to be shipped, the freight or express office at which the goods are to be delivered and the name or title of the transportation company from whom the consignee is to receive such goods. Such notice shall be mailed at least twenty-four hours before the day of such shipment.

SEC. 8. Any person, firm or corporation who shall sell, within this state, or import into this state, any fruit trees, plants or nursery stock, in violation of the provisions of this act, shall be deemed guilty of a misdemeanor, and, on conviction thereof, shall be fined for each offense in any sum not less than twenty-five nor more than one hundred dollars.

SEC. 9. Any person who shall offer for sale, or solicit persons within this state to purchase from him, any fruit trees, plants or nursery stock belonging to any person or firm not licensed under the provisions of this act, shall be deemed guilty of a misdemeanor, and fined in any sum not exceeding one hundred dollars ($100). All fines imposed for violation of the provisions of this act shall be paid to the treasurer of the county wherein the violation was committed, and placed to the credit of the general fund of such county.

SEC. 10. For the purpose of preventing the introduction and spread of contagious diseases, fruit pests, spores and fungus growth among fruit trees and plants and other nursery stock, and for the disinfection and cure of fruit tree diseases, and the extirpation of fruit pests, spores and fungus growth, the commissioner of horticulture shall prescribe such remedies as he shall deem best; describe and formulate such remedies, with their proper mode of application, with such additional instructions as he may deem necessary, into a circular or bulletin, which he shall have printed and distributed to the several county horticultural societies and inspectors in his district; he shall include also in said bulletin the rules and regulations under which a person, firm or corporation may lawfully sell, import into this state and sell or authorize to be sold, fruit trees, plants or nursery stock, and the penalties to be incurred for a violation of these rules; he shall prepare also a poster which shall contain said rules, regulations and penalties, which shall be distributed with the said bulletins. County inspectors are directed to put up said posters in not less than three conspicuous places in their county, one of which places must be in front of the county court house. The commissioner of horticulture shall hear and promptly decide all appeals from the county inspectors, and his decisions shall have full force and effect until set aside by the courts of the state. In all cases of appeal he shall disregard technicalities; decide each and every case on its merits. All appeals from county inspectors to the commissioner shall be under forms and regulations as prescribed by the commissioner. He shall approve or reject all bonds required by law to be submitted to him, and he shall file and safely keep all bonds and other papers by law required to be filed with him. He shall examine all fruits, specimens of fruit trees, shrubbery or plants submitted to him for examination; enter the result of his examination in a register to be kept by him for that purpose, and send a copy of such result to the person asking for the examination. He shall, from time to time, as he may deem for the best interests of the horticultural industry of the state, publish bulletins which shall be sent free to the various county horticultural societies in the state; such bulletins to contain a brief *resume* of the discoveries of science of interest to horticulture, or any other matter which the commissioner shall deem of importance to such interests. And unless there be urgent or special need therefor, no bulletin shall contain any matter that has appeared in any previous bulletin.

SEC. 11. County fruit inspectors who shall be appointed under and by authority of this act are hereby authorized and empowered to enforce the provisions of this act to prevent the introduction and spread of fruit tree and plant diseases, insect pests, fungi spores, eggs or larvæ of insects injurious to the fruit interests of his county or of this state.

SEC. 12. It is hereby made the duty of the county fruit inspector, if from his personal observation, complaint or other credible information, he has reason to suspect that any person, company or corporation has an orchard, trees or nursery of trees, vines or garden, fruit packing house, storeroom, or that any other place or material in his county is infected with, or is a repository for eggs, larvæ of any noxious insects injurious to fruits and plants, or that any trees, fruits or plants are in transit to his county from outside of this state, or about to be disseminated within his county, which are known or are suspected to be from localities that are infected with any disease or pests injurious, or that may become injurious to the fruit interests of his county or state. He shall without delay inspect the premises, property or materials so suspected, and if the same is found to be infected as aforesaid, he shall notify, in writing (prescribing the manner of disinfection), the owner, his agent, or the person in charge of the same, to treat and disinfect the said premises or property within five days. If any person so notified shall neglect or fail to disinfect such said premises or property in the manner and in the time prescribed in said notice, the person so notified and failing to disinfect the infected property or premises shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not less than five dollars ($5) nor more than fifty dollars ($50) and costs of action in court, which fine and costs shall be a judgment lien upon said premises or property. After the expiration of said ten days and the failure on the part of the owner or person in charge to disinfect the said premises or property as aforesaid, then, to prevent the spread of insect pests or disease, it will be the duty of the county inspector to enter on such premises or property and disinfect the same. The cost of such disinfection shall be a lien against said premises or property, the payment of which shall be collectible, with costs, in any court of the state.

SEC. 13. Any person or persons who shall bring into the state, sell, offer for sale, distribute or give away fruit trees, plants, shrubs, fruit or other material infested with any kind of insect pests injurious to fruit, fruit trees or plants, shall be guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than twenty-five dollars ($25) nor more than two hundred dollars ($200), or by imprisonment in the county jail not less than sixty days nor more than one year: *Provided*, That for each repeated offense the person or persons convicted, as aforesaid, may be punished by a fine of one hundred to two hundred dollars ($100 to $200), or by imprisonment not to exceed two years. Any person or persons who shall sell, offer for sale, distribute or give away any tree or trees, root or roots, grafts, cuttings or scions, infested with insect pests, spores or fungus growth, shall be deemed guilty of a misdemeanor, and on conviction thereof shall be punished by a fine [of] not less than five dollars ($5) nor more than twenty-five dollars ($25), or by imprisonment in the county jail not less than ten days nor more than thirty days. A repetition of the offense shall subject the offender to increased penalty, not over the maximum above stated. Any nursery trees, shrubs or plants which have been shipped from and to any place within the state for distribution or for planting, and which are infested with any injurious insects, larvæ or fungus growth, shall be disinfected under the direction of the inspector of the county whereto such trees and plants are taken, and the cost of said disinfection shall be charged to the owner of said articles, and shall be a lien on said trees, shrubs or plants until paid; and the person in possession of said articles being held subject to lien shall have a legitimate claim against the party from whom he received the articles for reimbursement of cost, including cost of collection, and may be enforced in any of the courts of the state. It is provided that if the cost of said disinfection is more than five dollars ($5), the expenses shall not exceed the rate of five cents per tree; and said lien to be foreclosed upon like notice and manner as in the case of sales of personal property on execution.

SEC. 14. The county fruit inspector shall, in the performance of his duty as such inspector, have on any day (except Sundays) free access to orchards, nurseries, gardens, hop fields, packing houses, fruit stands and store rooms where fruit may be kept; fruit boxes, full or empty, or any other materials or place suspected of being infested with insect pests or diseases injurious to the fruit interests of the state. If he find any nursery, orchard, garden or other place or material infected with insects or fungus growth, larvæ or spores injurious to the fruit interests, he shall forthwith notify in writing the owners, occupants or persons in possession thereof that the same is infected, and direct the manner in which the same shall be disinfected. If the owner, occupant or person in possession of said orchard, garden, store room, fruit stand or other place or infested material, shall not within ten days disinfect the same in the manner by the county inspector required, or shall not have appealed from the decision of the county inspector to the commissioner of horticulture, if the premises infected be an orchard or nursery of fruit trees, a garden, fruit stand or store room, and the person or persons in charge thereof having neglected or refused to disinfect the said premises within the time specified in said notice, nor have appealed as aforesaid, then the county inspector shall enter on and disinfect any of the said premises so neglected, and the costs thereof shall be a legitimate charge and lien, with interest until paid, upon the real property of the owner of such premises so disinfected; such lien shall be collectible, with costs of suit, in any of the courts of the state, as other lawful claims are collectible. If the infected property be transportable materials, the county inspector shall notify in writing the person in charge thereof to disinfect the same within twenty-four hours, and prescribe the manner of disinfection. If the person in charge of said infected materials neglect or refuse to disinfect the same as notified, or failed to appeal, then the inspector shall destroy such infected materials as fruits, fruit boxes, baskets, wrappings and portable fruit stands by burning the same. If an appeal be taken the inspector shall (after the twenty-four hours notice) take immediate possession of such moveable property and safely keep the same until the appeal is decided; if the decision of the commissioner be in favor of the appellant the property shall be returned to him; on an adverse decision the property will be destroyed by the inspector. All appeals from the action or demands of the county inspector shall be taken to the said state commissioner of horticulture.

SEC. 15. A certain act approved March 7, 1891, entitled "An act to create a state board of horticulture, and appropriate money therefor," and an act amendatory thereto approved March 11, 1895, and all other laws or parts of laws inconsistent or in conflict with the provisions of this act are hereby repealed.

Passed the House March 5, 1897.

Passed the Senate March 11, 1897.

Approved by the Governor March 17, 1897

OBITUARY.

D. M. JESSEE.

In the death of D. M. Jessee, of Walla Walla, president of the state board of horticulture, and commissioner for the fifth district, the board loses one of its best informed and most valued members. Mr. Jessee had devoted his entire life to horticultural work and was one of the best authorities on vegetable pathology and insect life in the state. His counsel was always regarded with great consideration by the board. He was eminently practical in all his horticultural methods. Mr. Jessee was of a quiet, unassuming and kindly nature, always genial and pleasant, and being one of the early pioneers of the Walla Walla valley, had formed many acquaintances throughout the commonwealth. His sudden demise will be greatly regretted by a large circle of admiring friends.

Mr. Jessee was born in Virginia, in 1822, and died in January, 1897. He came to this Pacific Coast in 1850, and since that time had served in many public capacities. In 1858 he was a member of the state legislature of Oregon, and twice since that time had served in the same capacity in our own state.